SONY

DIGITAL VIDEO HYBRID RECORDER

DNW-A100/A100P
DNW-A50/A50P
DNW-A45/A45P

ANALOG COMPOSITE DECODER BOARD
BKDW-505/506

SDTI INPUT KIT
BKNW-103

ANALOG COMPONENT INPUT BOARD
BKNW-104

AES/EBU I/F KIT
BKNW-105

BETACAM SX

MAINTENANCE MANUAL Part 2
Volume 1 1st Edition (Revised 1)

⚠警告

このマニュアルは，サービス専用です。
お客様が，このマニュアルに記載された設置や保守，点検，修理などを行うと感電や火災，人身事故につながることがあります。
危険をさけるため，サービストレーニングを受けた技術者のみご使用ください。

設置や保守，点検，修理などを行う前に，別冊のメンテナンスマニュアルPart 1の「安全のために」と別冊のオペレーションマニュアルの「安全のために」を必ずお読みください。

⚠WARNING

This manual is intended for qualified service personnel only.
To reduce the risk of electric shock, fire or injury, do not perform any servicing other than that contained in the operating instructions unless you are qualified to do so. Refer all servicing to qualified service personnel.

⚠WARNUNG

Die Anleitung ist nur für qualifiziertes Fachpersonal bestimmt.
Alle Wartungsarbeiten dürfen nur von qualifiziertem Fachpersonal ausgeführt werden. Um die Gefahr eines elektrischen Schlages, Feuergefahr und Verletzungen zu vermeiden, sind bei Wartungsarbeiten strikt die Angaben in der Anleitung zu befolgen. Andere als die angegeben Wartungsarbeiten dürfen nur von Personen ausgeführt werden, die eine spezielle Befähigung dazu besitzen.

⚠AVERTISSEMENT

Ce manual est destiné uniquement aux personnes compétentes en charge de l’entretien. Afin de réduire les risques de décharge électrique, d’incendie ou de blessure n’effectuer que les réparations indiquées dans le mode d’emploi à moins d’être qualifié pour en effectuer d’autres. Pour toute réparation faire appel à une personne compétente uniquement.

DNW-A100	Serial No. 10111 and Higher
DNW-A100P (UC)	Serial No. 10001 and Higher
DNW-A100P (CE)	Serial No. 10001 and Higher
DNW-A50	Serial No. 10001 and Higher
DNW-A50P (UC)	Serial No. 10001 and Higher
DNW-A50P (CE)	Serial No. 10001 and Higher
DNW-A45	Serial No. 10001 and Higher
DNW-A45P (UC)	Serial No. 10001 and Higher
DNW-A45P (CE)	Serial No. 10001 and Higher
BKDW-505	Serial No. 10001 and Higher
BKDW-506 (UC)	Serial No. 10001 and Higher
BKDW-506 (CE)	Serial No. 10001 and Higher
BKNW-103	Serial No. 10001 and Higher
BKNW-104	Serial No. 10001 and Higher
BKNW-105	Serial No. 10001 and Higher

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Manual Structure

Purpose of this manual

This manual is the Maintenance manual part 2 volume 1 of digital video hybrid recorder DNW series. DNW series includes the following models.

DNW-A100/A100P
DNW-A50/A50P
DNW-A45/A45P

This Maintenance manual part 2 is intended for use by trained system and service engineers, and provides the information that premises the parts level service (parts replacement, guideline for adjustment, schematic diagrams, board layouts, detailed parts list) . Moreover, provides the information for the following optional boards.

BKDW-505/506	Analog Composite Decoder Board
BKNW-103	SDTI Input Kit
BKNW-104	Analog Component Input Board
BKNW-105	AES/EBU I/F Kit

This manual (volume 1) explains about parts replacement and guideline for adjustment.

Contents

This manual is organized by following sections.

Maintenance manual part 2 volume 1 (9-967-659-)

Section 1 Service Overview

Explains the information of circuit protection devices, NV-RAMs, alignment tapes, and extension boards, the removal of PLCC IC, and the service actions after replacing/repairing the mounted circuit boards.

Section 2 Electrical Alignment Overview

Explains the overview for electrical alignment.

Section 3 Electrical Alignment

Explains the electrical alignment for the maintenance of this unit.

Section 4 Electrical Alignment for Optional Boards

Explains the electrical alignment for the maintenance of optional boards.

Section 5 Replacement of Main Parts

Explains the replacement of mechanical parts, power supply unit, hard disk drive (HDD), and circuit boards.

Section 6 Electrical Alignment after Main Parts Replacement

Explains the electrical alignment associated with replacement of parts that are described in Section 5.

Section 7 Tape Path Alignment

Explains the tape path alignment after replacement of parts that are described in Section 5.

Maintenance manual part 2 volume 2 (9-967-660-)

Section 1 Service Overview
Describes the notes on repair parts.

Section 2 Exploded Views
Describes the exploded views and the mechanical parts list (including some electrical parts) .

Section 3 Electrical Parts List
Describes the electrical parts list of each board (including some mechanical parts) . Moreover, describes the electrical parts list (frame electrical parts list) except on the board.

Section 4 Electrical Parts List for Optional Boards
Describes the electrical parts list of each optional board (including some mechanical parts) .

Section 5 Packing Materials and Supplied Accessories List
Describes the packing materials, packing materials for HDD and the supplied accessories list.

Section 6 Optional Fixtures List
Describes the optional fixtures and maintenance articles list.

Maintenance manual part 2 volume 3 (9-967-662-)

Section 1 Semiconductor Pin Assignments
Describes the semiconductor pin assignments.

Section 2 Block Diagrams
Describes the block diagrams of overall and each board.

Section 3 Schematic Diagrams and Frame Wiring
Describes the frame wiring and the schematic diagrams for the unit.

Section 4 Schematic Diagrams for Optional Boards
Describes the schematic diagrams for the optional boards.

Section 5 Board Layouts
Describes the board layouts for the unit and the optional boards.

Related manuals

Besides this “Maintenance manual part 2”, the following manuals are available for digital video hybrid recorder DNW series.

- **Operation Manual (Supplied with the DNW.)**
  This manual is necessary for application and operation (and installation) of the DNW.

- **Maintenance Manual Part 1 (Supplied with the DNW.)**
  This manual describes the information that is required to install, maintenance information, and the information for service such as replacement of plug-in boards.

- **Protocol Manual of Remote (9-pin) Connector (available on request)**
  This manual explains the protocol for controlling the VTR via the RS-422A (9-pin serial remote) . If this manual is required, please contact your local Sony Sales Office/Service Center.

Caution for Handling the Unit with Built-in HDDs (for Part 2)

This unit has two built-in hard disk drives (HDDs). Pay careful attention to the followings and perform operations with extra care when installing, servicing, and maintaining this unit.

Never give any mechanical shock and vibration

This may cause an HDD trouble or destroy the data in HDD.

- Pack this unit using the specified packing materials when carrying the unit. Use a cart with less-vibration when carrying this unit by a cart. If an excessive mechanical shock and vibration are applied, the HDD may be damaged.
- Never move this unit under power-on state. Take out or insert this unit from or into the rack in a state of powering off. Also never install or remove the cabinet under power-on state.
- When putting the unit on the floor, put this unit gently with the four specified feet which is attached to the bottom of the unit on the floor. If there are no feet on the bottom, attach them before putting this unit, or put this unit gently so that no sound is generated.

Never operate the unit for 30 seconds after the power is turned off

The disks in HDD rotate by inertia for a while after the power is turned off. In this case, the heads are in the unstable state. During this period, the HDD is more sensitive to a mechanical shock and vibration than during power on state. Never give even a slight shock at least 30 seconds after the power is turned off. Operations can be initiated (because the disks stop) after 30 seconds or more.

In the event of trouble in HDD

If there is something wrong with the HDD of this unit (a failure occurs in the HDD), handle this unit in the same manner as described above. This protects the HDD from increase of the damage till confirming the contents of the failure or analyzing the failure.

Pay careful attention to the following when handlings the HDD alone.

Notes when carrying or keeping the HDD

Pack the HDD using the specified packing materials when carrying or keeping the HDD. Moreover, choose the method which the HDD is not subject to the vibration when carrying.

Notes when replacing the HDD

Follow the procedure (described in Section 5) when replacing the HDD.

- If an excessive mechanical shock and vibration are applied, the unpacked HDD may be damaged. Place the unpacked HDD in a horizonal position (with the printed board side up) . Moreover, it is recommended that the unpacked HDD is put on the specified HDD cushion.
- Use the specified shockless torque screwdriver when tightening and removing the screw during replacing the HDD.
  The HDD cushion and shockless torque screwdriver are available as a fixture.

  HDD cushion : Part No. J-6530-060-A
  Shockless torque screwdriver : Part No. J-6530-070-A

- HDD is easily affected by static electricity. Take measures against static electricity such as establishing a ground, then install the HDD.

Handling of failed HDD

Handle the HDD that is removed because of a trouble or failure in the same manner as a normal HDD following above precautions. Then pack the HDD using the specified packing materials, contact your local Sony Sales Office/Service Center.

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Section 1
Service Overview

1-1. Circuit Protection Device (Fuse and IC Link)

Fuses or IC links for circuit protection are mounted on the boards of the VTR and on the optional boards.
A fuse or IC link will blow when abnormality occurs and an over-current flows (or over-heat occurs) in the equipment. Be sure to replace it with the specified fuse or IC link as shown below after tracing and removing the root of the fuse-blowing.

CAUTION

Use the specified part only

The fuse and IC link are critical parts to safe operation. Replace these components with Sony parts whose part numbers appear in this manual published by Sony. If not, this may cause a fire or electric shock. Be sure to use the specified component in this manual

Board name	Ref. No.	(address)	Description	Part No.	Remarks
AD-105 board	PS500 PS501	(B-7) (B-7)	Fuse (chip) 2 A, 125 V	⚠1-533-351-11	For BKNW-104
APR-12 board	PS900	(F-7)	Fuse (chip) 0.5 A, 125 V	⚠1-533-271-21	
APR-13 board	PS700	(G-7)	Fuse (chip) 0.5 A, 125 V	⚠1-533-271-21	
CP-297 board	PS100 PS101	(C-1) (C-1)	Fuse (chip) 1 A, 125 V	⚠1-533-380-21	
CP-300 board	PS100 PS101	(A-1) (A-1)	Fuse (chip) 1 A, 125 V	⚠1-533-380-21	For BKNW-103
DEC-65 board	PS901	(C-6)	Fuse (chip) 4 A, 125 V	⚠1-533-272-11	For BKDW-505/506 (UC)
			IC link (chip) 4 A	⚠1-533-348-11	For BKDW-506 (CE)
DIF-42 board	PS500 PS501	(G-5) (G-6)	Fuse (chip) 1 A, 125 V	⚠1-533-380-21	
DIF-44 board	PS401	(G-7)	Fuse (chip) 0.5 A, 125 V	⚠1-533-271-21	For BKNW-105
DPR-71 board	PS11 PS12 PS13 PS15	(G-7) (G-7) (H-7) (E-7)	Fuse (chip) 4 A, 125 V	⚠1-533-272-11	
DPR-73 board	PS100 PS101 PS102	(E-7) (E-7) (D-7)	Fuse (chip) 4 A, 125 V	⚠1-533-272-11	
DR-315 board	PS1	(A-5)	Fuse (chip) 5 A, 125 V	⚠1-533-275-21	
EQ-56 board	PS1	(G-7)	IC link (chip) 4 A	⚠1-533-348-11	
SE-378 board	F1 F3		Fuse (chip) 2 A, 125 V	⚠1-533-351-11	
	F2 F4		Thermal fuse 115 °C , 3 A, 125 V	⚠1-533-251-11	
SS-63 board	PS100	(E-7)	Fuse (chip) 3.15 A, 125 V	⚠1-533-266-11	
	PS101	(E-7)	Fuse (chip) 0.5 A, 125 V	⚠1-533-271-21	
SSX-1 board	PS100	(F-7)	Fuse (chip) 5 A, 125 V	⚠1-533-275-21	
	PS101 PS400	(F-7) (F-2)	Fuse (chip) 2 A, 125 V	⚠1-533-351-11	
TBC-23 board	PS1	(C-7)	Fuse (chip) 0.5 A, 125 V	⚠1-533-271-21	
TC-96 board	PS200 PS300	(D-1) (D-1)	Fuse (chip) 0.4 A, 125 V	⚠1-533-724-11	
VPR-17 board	PS900	(H-12)	Fuse (chip) 5 A, 125 V	⚠1-533-275-21	

Note: (address) means the mounted address of fuse or IC link.

1-2. Memory IC with Backup Battery

Memory IC (RAM) with backup battery is equipped on IC710 of the SS-63 board.
This IC is used to store the setting data of setup menu, etc. Besides it has an RTC (Real Time Clock) function, which is also used in the VTR.
Owing to this battery, even if the external power is cut off, this IC can maintain the stored data and the RTC continues operating.
However, if the battery life comes to end with the external power was cut off, memory can not maintain the stored data and the RTC is failing to function.

Life of the backup battery

Life of the backup battery is guaranteed for at least ten years in the absence of external power after this IC manufactured. Therefore, the replacement timing for IC710 varies depending on the operating condition (power-on time).

Replacement time

When life-ending the battery while the VTR is powered off, the RTC is failing to function.
If powered on in such a condition, the error code 96, sub error message "CALENDAR CLOCK" will be displayed. This message is displayed, be sure to replace IC710.

Note

- This sub error message is displayed on the video monitor connected to the VIDEO OUTPUT COMPOSITE 3 (SUPER) connector with the CHARACTER switch turned on.
  Other sub error messages, if present, are also displayed together.

- When the error code 96, sub error message “CALENDAR CLOCK” is displayed, the date in the calendar will be reset to 1/Nov./1996.
  You can check the date in calendar/clock using the error logger display mode (M2 : ERROR LOGGER) in the maintenance mode.

Note

After replacing IC710, make/change settings of various data and correct the calendar/clock.
Refer to “1-3. NV-RAM” for details.

1-3. NV-RAM

There are the NV-RAMs (EEP-ROM, and RAM with backup battery) and EVR ICs used on the boards (including optional boards) in the VTR. These devices store the adjustment data, various setting data for the VTR, data for the hours meters and error log respectively, etc.

EEP-ROM: Electric Erasable P-ROM
EVR: Electric Variable Resister (D/A converter with EEP-ROM)

After replacing above-mentioned device, take the following service actions.
“Service action after replacing” and “Stored data” are listed on next page.
IC710 on the SS-63 board is the only NV-RAM with backup battery.

Note

After replacing the NV-RAM, NV-RAM error (error code 96, 97, or 98) will occur at power-on.

After replacing IC710/SS-63:	Occurs Error code 96.
After replacing IC9/MS-50:	Occurs Error code 97.
After replacing IC908/DM-89:	Occurs Error code 98.
After replacing IC900/EQ-56:	Occurs Error code 98.
After replacing IC200/TBC-23:	Occurs Error code 98.

When replacing IC710 on the SS-63 board, NV-RAM error (error code 96) will be occur once at the first power-on. At the second power-on and later, this error will not occur.

Board / Ref.No.	Type	Stored data	Service action after replacing
AD-105 / IC602 (BKNW-104)	EVR IC	Adjustment data for AD-105 board	Readjust the AD-105 board. (Perform Section 4-3.)
CP-297 / IC308	EVR IC	Adjustment data for CP-297 board	Readjust the CP-297 board (SDI/SDTI input/ output system). (Perform Section 3-9.)
DEC-65 / IC301	EVR IC	Adjustment data for DEC-65 board	Readjust the DEC-65 board. (Perform Section 4-1.)
DM-89 / IC908	NV-RAM	Adjustment data for DM-89 board	Readjust the DM-89 board. (Perform the electrical adjustments in “6-4. DM-89 Board Replacement” of the maintenance manual Part 1.)
EQ-56 / IC900	NV-RAM	Adjustment data for EQ-56 board	Readjust the EQ-56 board. (Perform the electrical adjustments in “6-5. EQ-56 Board Replacement” of the maintenance manual Part 1.)
MS-50 / IC9	NV-RAM	Adjustment data for VTR servo system	After the initialization, readjust the VTR servo system. (Refer to Section 3-4.)
		Hours meter data	None (All data are lost and automatically initialized to count zero.)
		Serial No.	Set by the menu C41 of the maintenance mode.
		Head room of the audio level meter	Set by the menu C47 of the maintenance mode. (When setting it to except 20 dB.)
SS-63 / IC710	NV-RAM	Setting data of setup menu	Set the setup menu again.
		Error logs data	None (All data are lost.)
		ID code data	Set by the ISR (Interactive Status Reporting) application software.
		Calendar/clock	Set the calendar and clock again. (Refer to “6-6-2. Error Logging Data Clean and Calender/Clock Setting” of the maintenance manual Part 1.)
TBC-23 / IC200	NV-RAM	Adjustment data for TBC-23 board	Readjust the TBC-23 board. (Perform the electrical adjustments in “6-7. TBC-23 Board Replacement” of the maintenance manual Part 1.)
VPR-17 / IC909	EVR IC	Adjustment data for VPR-17 board	Readjust the VPR-17 board. (Perform the electrical adjustments in “6-9. VPR-17 Board Replacement” of the maintenance manual Part 1.)

1-4. Alignment Tape

Describes the alignment tapes used for adjusting the unit.

1. SR5-1 (SONY part No. 8-960-075-01): For 525/60 system
SR5-1P (SONY part No. 8-960-075-51): For 625/50 system

Used for video/audio adjustment.

Time (min. : sec.)	Digital video	Digital audio	CTL track
0:00 -	100 % color-bar	1 kHz sine wave, –20 dB FS	CTL
2:00 -	100 % color-bar	1 kHz sine wave, 0 dB FS	CTL
4:00 -	100 % color-bar	–∞ dB FS	CTL
6:00 -	100 % color-bar	20 Hz sine wave, –20 dB FS	CTL
8:00 -	100 % color-bar	20 kHz sine wave, –20 dB FS	CTL
10:00 -	Ramp	1 kHz sine wave, –20 dB FS	CTL
12:00 -	Ramp	1 kHz sine wave, 0 dB FS	CTL
14:00 -	Ramp	–∞ dB FS	CTL
16:00 -	Ramp	20 Hz sine wave, –20 dB FS	CTL
18:00 -	Ramp	20 kHz sine wave, –20 dB FS	CTL
20:00 -	100 % color-bar	1 kHz sine wave, –20 dB FS	CTL
22:00 -	100 % color-bar	1 kHz sine wave, 0 dB FS	CTL
24:00 -	100 % color-bar	–∞ dB FS	CTL
26:00 -	100 % color-bar	20 Hz sine wave, –20 dB FS	CTL
28:00 - 30:00	100 % color-bar	20 kHz sine wave, –20 dB FS	CTL

2. SR2-1 (SONY part No. 8-960-075-11) : For 525/60 system
SR2-1P (SONY part No. 8-960-075-61) : For 625/50 system

Used for servo adjustment.

Time (min. : sec.)	Digital video	Digital audio	CTL track
00:00-	3.212 MHz (A CH only)	SR2-1: 3 kHz, 0 VU	CTL
(Pulse*)		SR2-1P: 3.15 kHz, 0 VU	
15:00 -	A CH : 3.212 MHz	SR2-1: 3 kHz, 0 VU	CTL
	B CH : 6.424 MHz	SR2-1P: 3.15 kHz, 0 VU	
20:00 -	12.848 MHz (All CH)	SR2-1: 3 kHz, 0 VU	CTL
		SR2-1P: 3.15 kHz, 0 VU	
25:00 - 27:00	100 % color-bar (All CH)	No signal	CTL

∗: The time code data is not recorded on the time code track during pulse portion (00:00 to 15:00). This portion is recorded the duty 7:3 pulse on the CTL track. Therefore, when playing back this portion, time data which is interpolated by the time code signal is displayed.

3. CR2-1B (SONY part No. 8-960-096-01) : For analog Betacam, NTSC
CR2-1B PS (SONY part No. 8-960-096-51) : For analog Betacam, PAL

Used for tracking adjustment.

Time (min. : sec.)	Video Track	AFM	LAU track	CTL track
00:00 -28:00 (Pulse*)	Y : 4 MHz C : 5 MHz	No signal	No signal	CTL

∗: The time code data is not recorded on the time code track of this tape. But the duty 7:3 pulse is recorded on the time code track. Therefore, when playing back this tape, time data which is interpolated by the CTL signal is displayed.

4. CR5-1B (SONY part No. 8-960-096-41): For analog Betacam, NTSC
CR5-1B PS (SONY part No. 8-960-096-91): For analog Betacam, PAL

Used for Betacam video adjustment.

Time (min. : sec.)	Video	AFM*	LAU tracks	CTL track
0:00 -	RF sweep	No signal	No signal	CTL
2:00 -	60 % H sweep (CTDM)	No signal	No signal	CTL
5:00 -	Pulse & Bar (CTDM)	No signal	No signal	CTL
8:00 -	60 % multi-burst	No signal	No signal	CTL
11:00 -	Pulse & Bar	No signal	No signal	CTL
14:00 -	CR5-1B: 75 % color-bar CR5-1B PS: 100 % color-bar	400 kHz sine wave with 25 kHz deviation	No signal	CTL
16:30 -	CR5-1B: 75 % color-bar CR5-1B PS: 100 % color-bar	400 kHz sine wave with 75 kHz deviation	No signal	CTL
17:00 -	CR5-1B: 50 % bowtie & 12.5T CR5-1B PS: 50 % bowtie & 10T	No signal	No signal	CTL
19:00 -	Line 17	No signal	No signal	CTL
22:00 -	Quad phase	No signal	No signal	CTL
24:00 -	Flat filed	No signal	No signal	CTL
26:00 -	CR5-1B: 75 % color-bar with Drop-out CR5-1B PS: 100 % color-bar with Drop-out	No signal	No signal	CTL
28:00 - 30:00	Composite V sweep with VISC	No signal	No signal	CTL

*: DNW-A100/A50/A45/A100P/A50P/A45P can not play back AFM part.

5. CR5-2A (SONY part No. 8-960-097-44): For analog Betacam, NTSC
CR5-2A PS (SONY part No. 8-960-098-44): For analog Betacam, PAL

Used for Betacam video adjustment.

Time (min. : sec.)	Video	LAU tracks	CTL track
0:00 -	75 % color-bar	No signal	CTL
3:00 -	60 % multi-burst	No signal	CTL
6:00 -	CR5-2A: 50 % bowtie & 12.5T CR5-2A PS: 50 % bowtie & 10T	No signal	CTL
9:00 -	Pulse & Bar	No signal	CTL
11:00 -	Quad phase	No signal	CTL
13:00 - 15:00	Composite monoscope (Switching position is shifted.)	No signal	CTL

6. CR8-1A (SONY part No. 8-960-097-45): For analog Betacam, NTSC
CR8-1A PS (SONY part No. 8-960-098-45): For analog Betacam, PAL

Used for Betacam audio adjustment.

Time (min. : sec.)	LAU tracks	CTL track	Video
0:00 -	1 kHz sine wave, 0 VU	CTL	No signal
2:55 -	No signal	CTL	No signal
3:00 -	10 kHz sine wave, −10 VU	CTL	No signal
4:55 -	No signal	CTL	No signal
5:00 -	1 kHz sine wave, −20 VU	CTL	No signal
5:55 -	No signal	CTL	No signal
6:00 -	40 Hz sine wave, −20 VU	CTL	No signal
6:25 -	No signal	CTL	No signal
6:30 -	7 kHz sine wave, −20 VU	CTL	No signal
6:55 -	No signal	CTL	No signal
7:00 -	10 kHz sine wave, −20 VU	CTL	No signal
7:25 -	No signal	CTL	No signal
7:30 -	15 kHz sine wave, −20 VU	CTL	No signal
7:55 -	No signal	CTL	No signal
8:00 - 10:00	1 kHz sine wave, 0 VU	1 kHz sine wave, 0 VU	No signal

7. CR8-1B PS (SONY part No. 8-960-096-86): For analog Betacam, PAL

Used for Betacam audio adjustment.

Time (min. : sec.)	LAU tracks	CTL track	Video	AFM
0:00 -	1 kHz sine wave, 0 VU	CTL	No signal	No signal
2:55 -	No signal	CTL	No signal	No signal
3:00 -	15 kHz sine wave, 0 VU	CTL	No signal	No signal
4:55 -	No signal	CTL	No signal	No signal
5:00 -	1 kHz sine wave, −20 VU	CTL	No signal	No signal
5:55 -	No signal	CTL	No signal	No signal
6:00 -	40 Hz sine wave, −20 VU	CTL	No signal	No signal
6:25 -	No signal	CTL	No signal	No signal
6:30 -	7 kHz sine wave, −20 VU	CTL	No signal	No signal
6:55 -	No signal	CTL	No signal	No signal
7:00 -	10 kHz sine wave, −20 VU	CTL	No signal	No signal
7:25 -	No signal	CTL	No signal	No signal
7:30 -	15 kHz sine wave, −20 VU	CTL	No signal	No signal
7:55 - 8:00	No signal	CTL	No signal	No signal

1-5. Extension Board

Extension board to extend the plug-in board is available in three types.

For Large Plug-in Board

Description: Extension board (L), EX-555
SONY part No.: A-8277-211-A

For Small Plug-in Board

For the small plug-in board is available in following two types.

1. For APR-12/13, DIF-42/44, and EQ-56 boards

Description: Extension board (S), EX-556
SONY part No.: A-8277-212-A

Note

DIF-42 board is included in AES/EBU I/F kit BKNW-105 (optional kit).

2. For AD-105, DEC-65, DM-89, and TBC-23/24 boards

Description: Extension board (S), EX-377
SONY part No.: J-6269-810-A

Notes

- AD-105 board is the analog component input board BKNW-104 (optional board).
- DEC-65 board is the analog component input board BKDW-505/506 (optional board).

1-6. PLCC IC Removal

It is recommended that the tool below is used to remove the PLCC-type IC inserted into an IC socket.

Tool required

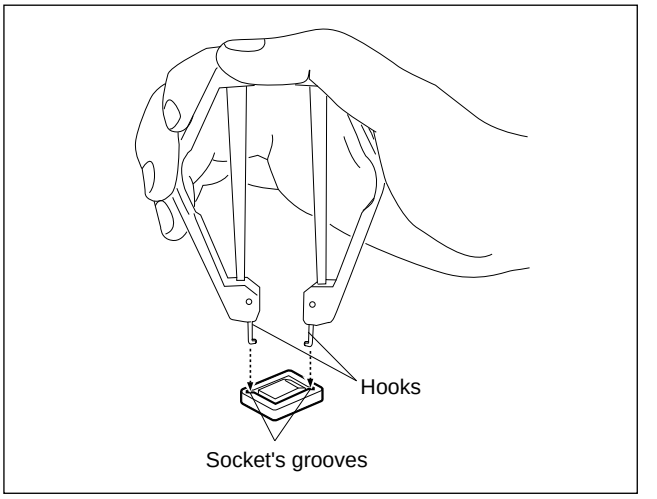
Description: IC extraction tool for PLCC socket
SONY Part No. J-6035-070-A
This tool can be used for IC whose pins number are 20 to 124.

Procedure

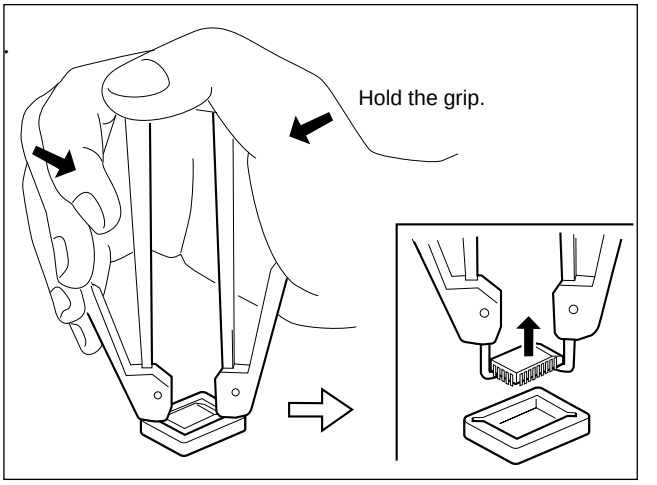
Notes

- Do not pull the IC upward using a hook of the extraction tool.
- Do not interpose the tool by excessive force.

1. Fit the tool's hooks in the grooves of IC socket.



2. Hold the grip as shown in the figure.
   Then holds IC with hooks, and removes it from the socket.
3. Lift up the tool softly with IC nipping.



1-7. Service Action after Replacing or Repairing the Mounted Circuit Board

After replacing or repairing the mounted circuit board (except DUS-xxx boards) in this VTR, be sure to perform the following adjustment or the function check. If no instruction about "After replacing:" or "After repairing:" is given, be sure to take the followed action in both replacing and repairing.

Note

When using the menu of the setup or maintenance mode, connect the analog composite video monitor to VIDEO OUTPUT COMPOSITE 3 (SUPER) connector.

1-7-1. AC-169 Board

After replacing or repairing this board, turn the power on and check that the power is correctly applying to the VTR by the rotation of fan motor or condition of indicator.

1-7-2. AD-105 Board (BKNW-104)

After replacing or repairing this board, perform the electrical adjustments of Section 4-3.

Note

Since the mounted AD-105 board is out of service part, be sure to replace it with the product BKNW-104 when this board is replaced.

1-7-3. APR-12 Board

After replacing:

Perform "6-2. APR-12 Board Replacement" of the maintenance manual part 1.

After repairing:

Perform the audio system alignment of Section 3-6.

1-7-4. APR-13 Board

After replacing:

Perform "6-3. APR-13 Board Replacement" of the maintenance manual part 1.

After repairing:

Perform the audio system alignment of Section 3-6.

1-7-5. CCM-15 Board

For the threading motor

After replacing or repairing this board, check the functions of the threading motor using C012 : THREADING MOTOR in the maintenance mode.

(Refer to "4-2-2. SERVO CHECK Mode (C0)" of the maintenance manual part 1.)

For the reel shift motor

After replacing or repairing this board, check the functions of the reel shift motor using C016 : REEL SHIFT MOTOR in the maintenance mode.

(Refer to "4-2-2. SERVO CHECK Mode (C0)" of the maintenance manual part 1.)

Note

Since the mounted CCM-15 board is out of service part, prepare the plain CCM-15 board and the components of the CCM-15 board when replacing this board.
For the mounted component on this board, refer to Section 3 of the maintenance manual part 2, volume-2.

1-7-6. CL-29 Board

After replacing or repairing this board, check that the compartment block in the cassette compartment moves up and down normally using C013 : CASSETTE COMP. of the maintenance mode.
(Refer to "4-2-2. SERVO CHECK Mode (C0)" of the maintenance manual part 1.)

1-7-7. CP-277 Board

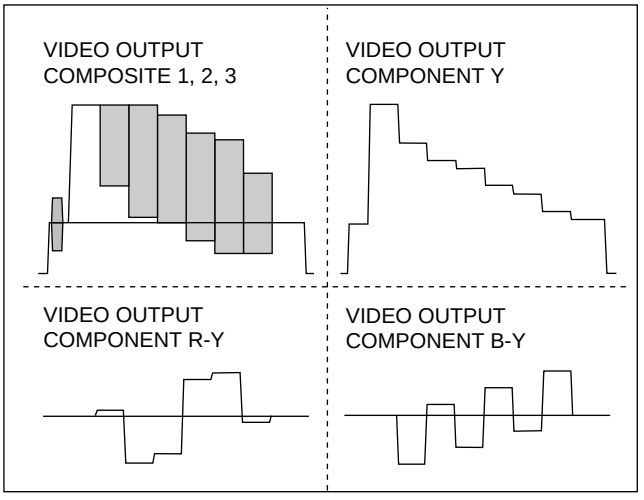
Perform the following check after replacing or repairing this board.

Preparing tools

- Analog composite video signal generator:
  TEKTRONIX TSG-170A or equivalent
- Analog component video signal generator:
  TEKTRONIX TSG-300 or equivalent
  (It is required only for the VTR with BKNW-104.)
- Analog composite waveform monitor
  DNW-A100/A50/A45: TEKTRONIX 1750, 1780R, or equivalent
  DNW-A100P/A50P/A45P: TEKTRONIX 1751, 1781R, or equivalent
- Analog component waveform monitor:
  TEKTRONIX WFM300 or equivalent
- Analog component video monitor
  Used for displaying of the menu. Usually, connect it to VIDEO OUTPUT COMPOSITE 3 (SUPER) connector.
- 75 Ω terminators (4 pieces.)

Preparations

1. Set the following switches on the sub control panel.
   OUT REF switch: INPUT VIDEO
   CHARACTER switch: ON
2. Set the operation system in the VTR using the setup menu ITEM-013 as follows:
   DNW-A100/A50/A45: 525/60 system
   DNW-A100P/A50P/A45P: 625/50 system
   (Refer to Section 7-2-2 of the operation manual.)



Ex. 75 % Color-bar

3. Press the PB.EE button on the lower control panel to light its indicator.
4. Set the setup extend menu ITEM-105 to “ON”.
5. For the DNW-A100/A50/A45 only, set the sub-ITEMs 0 and 1 in the setup extend menu ITEM-709 to “D-1”.
6. Input the analog composite video signal (BB signal) to REF. VIDEO connector (75 Ω switch: ON).

Checks

VTR with BKDW-505/506 or BKNW-104

1. Set the setup extend menu ITEM-309 to “AUTO”.
2. VTR with BKDW-505/506:
   Input the 75 % color-bar signal (composite) to VIDEO INPUT COMPOSITE connector (75 Ω switch: ON), and set VIDEO INPUT SELECT to “COMPOSITE”.
   VTR with BKNW-104:
   Input the 75 % color-bar signal (D-1 format, component) to VIDEO INPUT COMPONENT connectors (Y/R-Y/B-Y), and set VIDEO INPUT SELECT to “COMPONENT”.
4 Check that the STOP button is not blinking.
5. With the CHARACTER switch turned to “OFF”, check that no abnormality exists in the output signal from all the VIDEO OUTPUT connectors (COMPOSITE 1/2/3, and COMPONENT Y/R-Y/B-Y) using the two waveform monitors.

VTR without BKDW-505/506 or BKNW-104

1. Set the setup extend menu ITEM-309 to “EXT”.
2. To generate the test signal within VTR, select “75 % Color Bars” using C21 : VIDEO TEST SG of the maintenance mode.
   (Refer to “4-2-6. AUDIO/VIDEO CHECK Mode (C2)” of the maintenance manual part 1.)
3. With the CHARACTER switch turned to “OFF”, check that no abnormality exists in the output signal from all the VIDEO OUTPUT connectors (COMPOSITE 1/2/3, and COMPONENT Y/R-Y/B-Y) using the two waveform monitors.
4. Check that the STOP button is not blinking.
5. Exit the maintenance mode.

Perfection

1. Set the CHARACTER switch to “ON”.
2. Return the setup extend menus ITEM-105/309/709 to the customer settings, and the OUT REF and CHARACTER switches to the customer settings.

1-7-8. CP-278 Board

After repairing this board, perform the following checks.

Preparing tools

- Audio signal generator:
  TEKTRONIX SG505 option-02 or equivalent
- Audio analyzer:
  TEKTRONIX AA501A option-02 or equivalent

Checks

1. Set AUDIO INPUT/MIXING/MONITOR SELECT to "INPUT", and select "ANALOG".
2. Perform the following check for each channel.
   (1) Set the analog audio input level switch to "600 Ω".
   (2) Input the audio signal of 1 kHz +4.0 dBm (600 Ω) to AUDIO INPUT connector from the signal generator.
   (3) Check that the audio level at AUDIO OUTPUT connector is 4.0 ±0.5 dBm by the audio analyzer.
   (4) Return the analog audio input level switch to the customer setting.

1-7-9. CP-297 Board

After repairing this board, perform the SDI/SDDI I/O lines electrical adjustments of Section 3-10.

1-7-10. CP-300 Board (BKNW-103)

After replacing:

Perform the function check of Section 4-2-2.

Note

Since the mounted CP-300 board is out of service part, be sure to replace it with the product BKNW-103 when this board is replaced.

After repairing:

Perform the electrical adjustments of Section 4-2.

1-7-11. CP-301 Board

After repairing this board, perform the following checks.

Preparing tools

- Time code generator:
  525/60 system: SONYBVG-1600 or equivalent
  625/50 system: SONY BVG-1600PS or equivalent
- Time code reader
  525/60 system: SONY BVG-1500 or equivalent
  625/50 system: SONY BVG-1500PS or equivalent
- Audio analyzer:
  TEKTRONIX AA501A option-02 or equivalent

Checks

1. Connect the time code generator to TIME CODE IN connector, and the time code reader to TIME CODE OUT connector.
2. Set the upper control panel as follows:
   TC/AUTO/VISC: LTC
   INT/EXT: EXT
   PRESET/REGEN: PRESET
3. Check that the reader can read correctly the time code from the generator.
4. Return the above switches in the upper control panel to the customer settings.
5. To generate the test signal within VTR, select "1KHz SINE 0VU" using C22 : AUDIO TEST SG of the maintenance mode.
   (Refer to "4-2-4. AUDIO/VIDEO CHECK Mode (C2)" of the maintenance manual part 1.)
6. Check that the audio level at MONITOR OUTPUT L connector is 4.0 ±0.5 dBm by the audio analyzer.
7. Check that the audio level at MONITOR OUTPUT R connector is 4.0 ±0.5 dBm by the audio analyzer.
8. Exit the maintenance mode.

1-7-12. CP-308 Board (BKNW-105)

After repairing this board, perform the function check of Section 4-4.

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1-7-13. DEC-65 Board (BKDW-505/506)

After replacing:

Perform “1-16-2. Check after Installing” of the maintenance manual part 1.

Note

Since the mounted DEC-65 board is out of the service part, be sure to replace it with the product BKDW-505 or BKDW-506 when this board is replaced.

After repairing:

Perform the electrical adjustments of Section 4-1.

1-7-14. DIF-42 Board

After replacing or repairing this board, perform the following check.

Tools

- Digital component video signal generator:
  TEKTRONIX TSG-422 option-1S or equivalent
- Video monitor for the serial digital input:
  SONY BVM-1410 (with optional BKM-2085-14) or equivalent

Check

1. Set VIDEO INPUT SELECT to “SDI”.
2. Input the 4:2:2 component digital video signal to SDI INPUT connector from the digital component video signal generator.
3. Check that no abnormality exists in the picture watching the video monitor connected to SDI OUTPUT connector.

1-7-15. DIF-44 Board (BKNW-105)

After replacing or repairing this board, perform the function check of Section 4-4.

Note

Since the mounted DIF-44 board is out of the service part, be sure to replace it with the product BKNW-105 when this board is replaced.
In this time, it is not necessary to replace the CP-308 board.
But, when replacing the CP-308 board at the same time, refer to “1-19. Installation of BKNW-105” of the maintenance manual part 1.

1-7-16. DM-89 Board

Note

The board that a suffix of service parts code is A is inavailable for this unit.

After replacing:

Perform “6-4. DM-89 Board Replacement” of the maintenance manual part 1.

After repairing:

Perform the electrical adjustments in “6-4. DM-89 Board Replacement” of the maintenance manual part 1.

1-7-17. DPR-71 Board

After replacing or repairing this board, check that the VTR is able to correctly record the audio and video on the cassette tape and play back.

1-7-18. DPR-73 Board

After replacing or repairing this board, check that the VTR is able to correctly record the audio and video into the hard disk drives and play back.

1-7-19. DR-315 Board

After replacing or repairing this board, perform the servo system electrical adjustments of Sections 3-4-3 and 3-4-5.

1-7-20. EQ-56 Board

After replacing or repairing this board, perform the RF system electrical adjustments of Section 3-5.

Note

May perform “6-5. EQ-56 Board Replacement” of the maintenance manual part 1. This substance is nearly equal to Section 3-5.

1-7-21. FP-91 Board

After replacing or repairing this board, perform the electrical adjustments of Section 3-9.

1-7-22. KY-364 Board

After replacing or repairing this board, check the functions of the switches, indicators, etc. on this board.

1-7-23. LP-81 Board

After replacing or repairing this board, perform the following checks.

1. Check the function of the cassette compartment when inserting the cassette tape.
2. Check that the all cassette compartment lamps (LEDs) are lighted with the cassette tape inserted.

1-7-24. MB-648 Board

After replacing or repairing this board, check the VTR’s basic function is correct.

1-7-25. MS-50 Board

After replacing this board or its NV-RAM

1. Perform the servo system electrical adjustments of Section 3-4.

   Note

   Be sure to initialize the servo adjustment data in the NV-RAM on the MS-50 board.
   (Refer to Section 3-4-2.)
2. Set the serial number of the VTR using C41 : SERIAL NUMBER in the maintenance mode.
   (Refer to “4-2-6. OTHERS CHECK Mode (C4)” of the maintenance manual part 1.)
3. Set the head room of the audio level meter using C47 : METER HEAD ROOM in the maintenance mode.
   (Refer to “4-2-6. OTHERS CHECK Mode (C4)” of the maintenance manual part 1.)

After repairing (except the NV-RAM replacement):

Usually perform the servo system alignment of Section 3-4.

When repairing the circuit containing from RV901 to CN24 in the demagnetization head driving circuit on the MS-50 board, perform “3-3. Demagnetization Head Driving Voltage Adjustment”.

1-7-26. PC-70 Board

After replacing or repairing this board, perform the following checks.

1. Check the function of the cassette compartment using C013 : CASSETTE COMP. in the maintenance mode.
   (Refer to “4-2-2. SERVO CHECK Mode (C0)” of the maintenance manual part 1.)
2. Check the functions of the cassette size sensors and cassette-in sensors in the cassette compartment using C001 : CASSETTE COMP. SW in the maintenance mode.
   (Refer to “4-2-2. SERVO CHECK Mode (C0)” of the maintenance manual part 1.)

1-7-27. PD-35 Board

After replacing or repairing this board, check the function of the pinch solenoid using C020 : PINCH ROLLER of the maintenance mode.
(Refer to “4-2-2. SERVO CHECK Mode (C0)” of the maintenance manual part 1.)

Note

Since the mounted PD-35 board is out of service part, prepare the plain PD-35 board and the components of the PD-35 board when replacing this board.
For the mounted component on this board, refer to Section 3 of the maintenance manual part 2, volume-2.

1-7-28. PTC-54 Board

After replacing or repairing this board, check that error code 09 does not occur while the tape is threading.

1-7-29. PTC-59 Board

Note

Since the mounted PTC-59 board is out of service part, be sure to replace the MC sensor assembly when needing to replace this board.

After replacing the MC sensor assembly or repairing this board, check the functions of the cassette tab sensors using C000 : CASSETTE SW in the maintenance mode.
(Refer to “4-2-2. SERVO CHECK Mode (C0)” of the maintenance manual part 1.)

1-7-30. PTC-69 Board

After replacing or repairing this board, perform the electrical adjustments of Section 3-2.

Note

When replacing the search dial assembly, need not the electrical adjustments for the PTC-69 board is not needed.

1-7-31. PTC-71 Board

After replacing or repairing this board, check the functions of the reel position sensors using C016 : REEL SHIFT MOTOR of the maintenance mode.
(Refer to “4-2-2. SERVO CHECK Mode (C0)” of the maintenance manual part 1.)

1-7-32. RM-82 Board

After replacing or repairing this board, perform “Adjustment after Replacement” in “5-9. Reel Motor Assembly Replacement”.

1-7-33. SE-341 Board

After replacing or repairing this board, perform the following checks.

1. Check the function of the dew condensation sensor using C003 : DEW SENSOR in the maintenance mode.
   (Refer to “4-2-2. SERVO CHECK Mode (C0)” of the maintenance manual part 1.)
2. Check that the VTR is able to record on the cassette tape.

1-7-34. SE-344 Board

Note

Since the mounted SE-344 board and the component on this board are out of service parts, be sure to replace the reel FG assembly when needing to replace/repaire this board.

After replacing the reel FG assembly, perform “5-9-7. Reel Table Rotation Sensor Position Adjustment”.

1-7-35. SE-378 Board

After replacing or repairing this board, check that the DISK BUSY indicator on the lower control panel is go out 30 seconds after turning on the POWER switch.

1-7-36. SS-63 Board

After replacing:
Perform “6-6. SS-63 Board Replacement” of the maintenance manual part 1.

After replacing the NV-RAM:
Perform “Service action after replacing” that is described in the table of “1-3. NV-RAM”.

After repairing (Except the NV-RAM replacement):
Perform the servo system electrical alignment of Section 3-4.

1-7-37. SSX-1 Board

After replacing or repairing this board, perform the following checks.

1. Check that errors (error code D1 to D8) do not occur after turning on the POWER switch.
2. Check that the VTR is able to correctly record the audio and video into the hard disk drives and play back.

1-7-38. SWC-30 Board

After replacing or repairing this board, check the functions of the switches and indicators on this board.

1-7-39. SWC-31 Board

After replacing or repairing this board, check the functions of the switches and volumes on this board.

Note

Perform the system phase adjustment again for the VTR referring to the manual of the analog switcher when using the analog switcher with this VTR.

1-7-40. TBC-23 Board

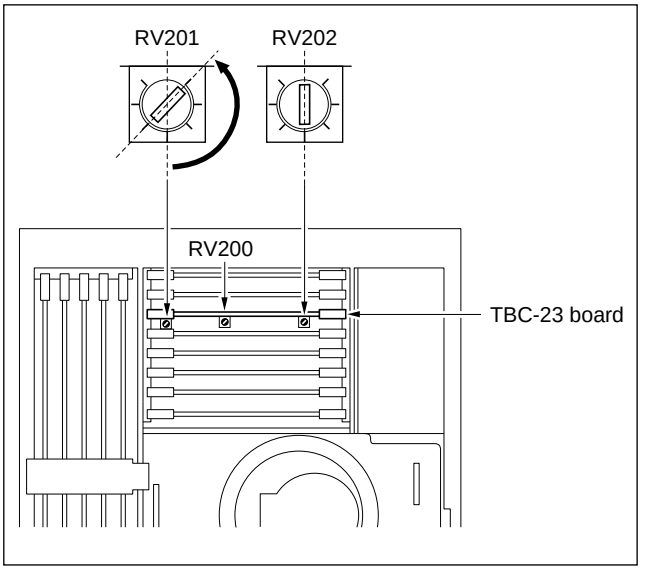
Notes

- The board that a suffix of service parts code is A is inavailable for this unit.
- The boards of board number suffixes 13 and 14 are inavailable for this unit without completing the specified modification to them.

After replacing:
Perform “6-7. TBC-23 Board Replacement” of the maintenance manual part 1.

After repairing:

1. Set RV201 and RV202 on the TBC-23 board as shown figure below.



RV201 and RV202 on TBC-23 Board

2. Perform “6-7. TBC-23 Board Replacement” of the maintenance manual part 1.

1-7-41. TBC-24 Board

Note

The boards of board number suffixes 11 through 15 are inavailable for this unit without completing the specified modification to them.

After replacing:

Perform “6-8. TBC-24 Board Replacement” of the maintenance manual part 1.

After repairing:

- When RV202 on the TBC-24 board (board number suffix is 16 and higher) for DNW-A100P/A50P/A45P was replaced, set RV202 to the mechanical center.
- When RV303 on the TBC-24 board was replaced, perform “ 3-8-21. TBC VCO Free-running Adjustment” and later (except Section 3-8-22).
- In other case, perform the electrical adjustment in “6-8. TBC-24 Board Replacement” of the maintenance manual part 1.

1-7-42. TC-96 Board

After replacing or repairing this board, perform Section 3-11.

1-7-43. TR-78 Board

Note

Since the mounted TR-78 board and the component on this board are out of service parts, be sure to replace the S-tension regulator assembly when needing to replace/repaire this board. (Refer to Section 5-16.)

After replacing the S-tension regulator assembly, perform the tape running adjustment of Section 7-1-2.

1-7-44. TR-79 Board

After replacing or repairing this board, perform the following checks.

1. Check the functions of the threading and unthreading sensors using C012 : THREADING MOTOR in the maintenance mode.
   (Refer to “4-2-2. SERVO CHECK Mode (C0)” of the maintenance manual part 1.)
2. Execute A008 : S/T TENSION OFFSET in the maintenance mode. The store the adjustment data.
   (Refer to “4-2-7. SERVO ADJUST Mode (A0)” of the maintenance manual part 1.)

1-7-45. VPR-17 Board

After replacing or repairing this board, perform the video system alignment of Section 3-7.

Note

May perform “6-9. VPR-17 Board Replacement” of the maintenance manual part 1. This substance is nearly equal to Section 3-7.

1-7-46. VR-223 Board

After replacing or repairing this board, check the functions of the switches and volumes on this board.

1-7-47. VR-224 Board

After replacing or repairing this board, check the functions of the switches and volumes on this board.

1-8. Perfection after Replacing the Hard Disk Drive

The new-installed head disk drive(s) by replacement requires initializing in the HDD installation menu (D3 : INSTALLATION) of the maintenance mode.

The HDD installation menu is automatically activated when the power is turned on first after the hard disk drive has been replaced, then initialize all of the replaced hard disk drive(s) referring to Section 4-3-5 of the maintenance manual part 1.

Section 2
Electrical Alignment Overview

Explains the general information for the electrical alignments of Sections 3 and 4.

2-1. Notes on Electrical Alignment

- Be sure to adjust each block in order unless any instructions are provided.
- Never touch (or turn) the adjustment part carelessly.
- Do not execute automatic adjustment carelessly, and do not change adjustment data carelessly.
  If executed or changed carelessly, turn off the power of the VTR or execute “ALL DATA PREVIOUS” in each NV-RAM control menu so as not to save the data.
  Note
  NV-RAM control menu for the servo system have no function “ALL DATA PREVIOUS”.
  If executed carelessly the automatic adjustment, turn off the power of the VTR.
- For details on the maintenance mode, refer to Section 4 of the maintenance manual Part 1.
- Before beginning adjustment, it is recommended to make a copy of check sheets given in the maintenance manual Part 1 “Appendix B” and write down setup conditions such as switches’ setting in the check sheets.
  If setup conditions are noted, the settings can be returned easily to its original condition after finishing adjustment.

2-2. Outline of Electrical Alignment

In Sections 3 and 4 explain the all electrical adjustment to each block (include the optional boards).

Block	Reference	Contents
Power supply unit	Section 3-1	Output voltage check/adjustment of power supply unit
Search dial	Section 3-2	Search dial pulse duty adjustment
Demagnetization head	Section 3-3	Demagnetization head driving voltage adjustment for VTR
Servo	Section 3-4	Servo system alignment for VTR
RF	Section 3-5	RF system alignment for VTR
Analog audio	Section 3-6	Adjustments of Analog audio input/output line and Analog Betacam LAU PB line
Video	Section 3-7	Adjustments of Video reference signal, Video process, and Analog video output
Analog Betacam video	Section 3-8	Analog Betacam video PB system alignment for VTR
Video remote control	Section 3-9	Remote control offset adjustment
SDI/SDTI	Section 3-10	Free-running VCO adjustment of Encoder/Decoder for SDI input/output and SDTI output
Time code	Section 3-11	Time code system adjustment/check for VTR
Composite video input	Section 4-1	Electrical adjustment for BKDW-505/506
Component video input	Section 4-3	Electrical adjustment for BKNW-104
SDTI input	Section 4-2	Electrical adjustment for BKNW-103
Digital audio	Section 4-4	Electrical adjustment for BKNW-105

2-3. Required Equipment/Tools

Describes the equipment and tools used for Sections 3 and 4 as follows:
It is recommended to use the equipment listed below or the equivalents.

Note

For the equipment and tools, describes in each section (adjustment block or adjustment item) too.

Equipment/Tool	For DNW-A100/A50/A45	For DNW-A100P/A50P/A45P
Analog component video signal generator	Tektronix TSG-300	⇦ (This mark; The same as left)
Analog composite video signal generators	Tektronix TSG-170A	Tektronix TSG-271
	Tektronix 1410	Tektronix 1411
Analog component video waveform monitor	Tektronix WFM300	⇦
Analog composite video waveform/vector monitor	Tektronix 1750 or 1780R	Tektronix 1751 or 1781R
Oscilloscope	Tektronix 2465B	⇦
Spectrum analyzer	Advantest R3261A	⇦
Network analyzer	Anritsu MS420B	⇦
Audio signal generator	Tektronix SG505-OP.02	⇦
Audio analyzer	Tektronix AA501A-OP.02	⇦
Audio level meter	Hewlett-Packard HP3400A	⇦
Digital voltmeter	Advantest TR6845	⇦
Frequency counter	Advantest TR5821AK	⇦
Analog composite video monitor	(NTSC/PAL switchable type)	⇦
Terminator	75-ohm, BNC type (max. 5 pieces)	⇦
BNC T adapter	75-ohm (1 piece)	⇦
Shorting clips	(max. 2 pieces)	⇦
Solder iron	(Low power type)	⇦
Cleaning tape	Sony BCT-5CLN	⇦
Recording tape	Sony BCT-SX series (BCT-32SX etc.)	⇦
Betacam SP cassette (Metal particle type)	Sony BCT-MA series (BCT-30MA etc.)	⇦
Extension boards	EX-377 (Sony part No. J-6269-810-A)	⇦
	EX-555 (Sony part No. A-8277-211-A)	⇦
	EX-556 (Sony part No. A-8277-212-A)	⇦
TBC board extension harness	14P (Sony part No. 1-952-684-11)	⇦
VISC phase adjustment tool	—	(Sony part No. A-6332-240-A)
Alignment tapes	CR2-1B (Sony part No. 9-960-096-01)	CR2-1B PS (Sony part No. 9-960-096-51)
	CR5-1B (Sony part No. 8-960-096-41)	CR5-1B PS (Sony part No. 8-960-096-91)
	CR5-2A (Sony part No. 8-960-097-44)	CR5-2A PS (Sony part No. 8-960-098-44)
	—	CR8-1B PS (Sony part No. 8-960-096-86)
	CR8-1A (Sony part No. 8-960-097-45)	CR8-1A PS (Sony part No. 8-960-098-45)
	SR5-1 (Sony part No. 8-960-075-01)	⇦
	SR2-1 (Sony part No. 8-960-075-11)	⇦
	SR5-1P (Sony part No. 8-960-075-51)	⇦
	SR2-1P (Sony part No. 8-960-075-61)	⇦

2-4. Internal Video Test Signal

VTR has the internal video test signal generator.
There are two ways to generate the test signal with this generator.

- Setup extend menu
  ITEM-710 : INTERNAL VIDEO SIGNAL GENERATOR
  For detail, refer to “7-3. Extend Menu” of the operation manual.
- Maintenance mode
  C21 : VIDEO TEST SG
  For detail, refer to “4-2-4. AUDIO/VIDEO CHECK Mode (C2)” of the maintenance manual Part 1.

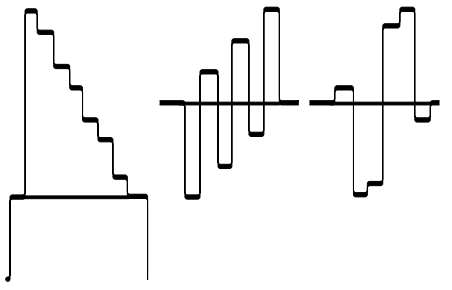
Describes output waveform figures of this generator below. There figures are drawn from waveforms that are watched COMPONENT OUT with the waveform monitor. They are measured with H rate and displayed with PARADE unless otherwise specified.

Note

In the 525/60 system, when selecting either D-1 format or Betacam format, set by the setup extend menu ITEM-709 : CAV LEVEL FORMAT, SUB-ITEM 1 : OUTPUT CAV LEVEL.
In the 625/50 system have no Betacam format.

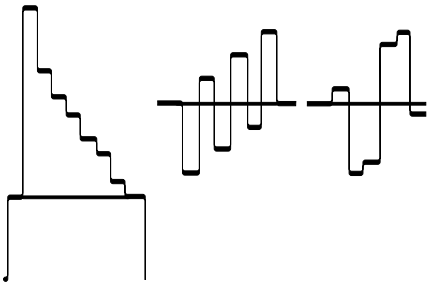
100% Color Bars

D-1 format

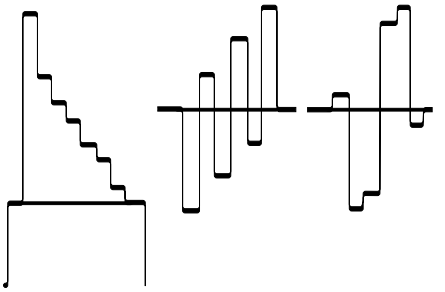


75% Color Bars

D-1 format

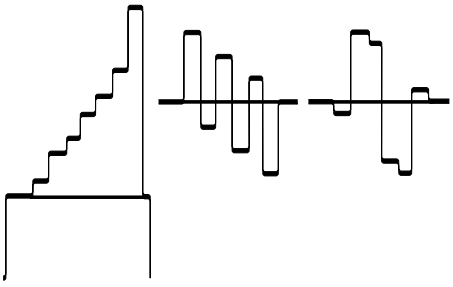


Betacam format

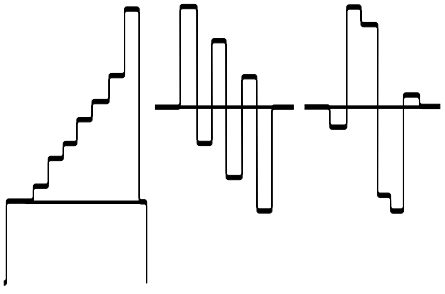


75% Reverse Color Bars

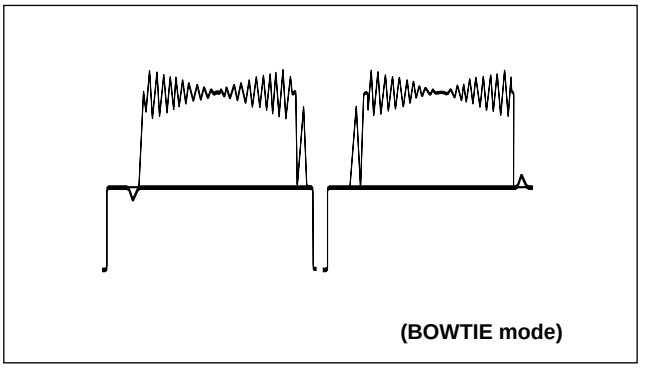
D-1 format



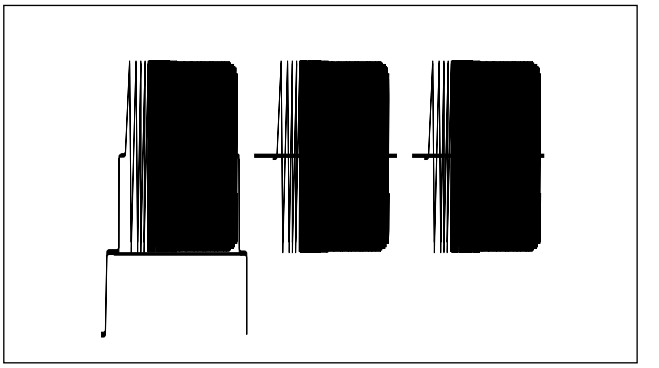
Betacam format (525/60 system only)



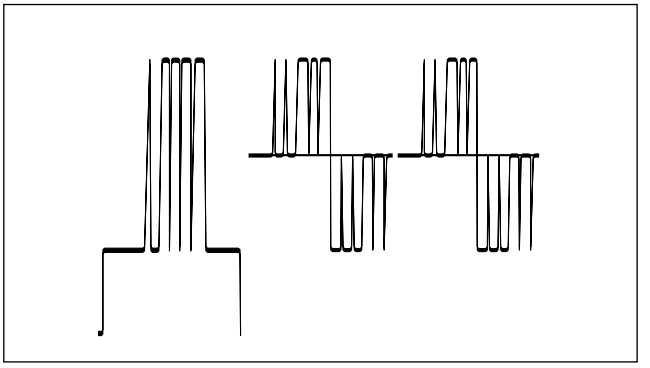
Bowtie



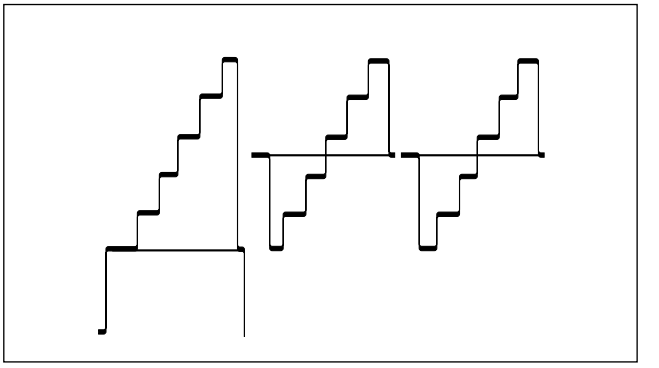
H Sweep



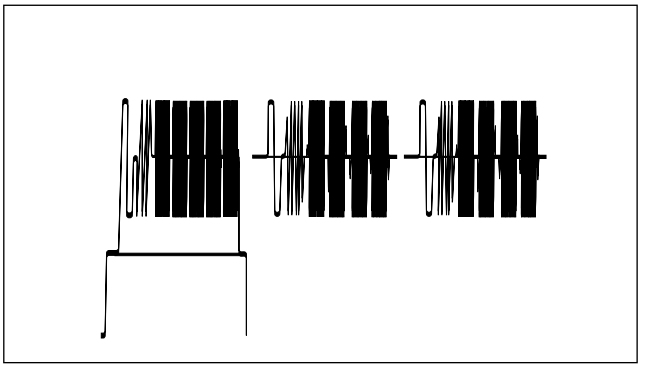
Pulse and Bar



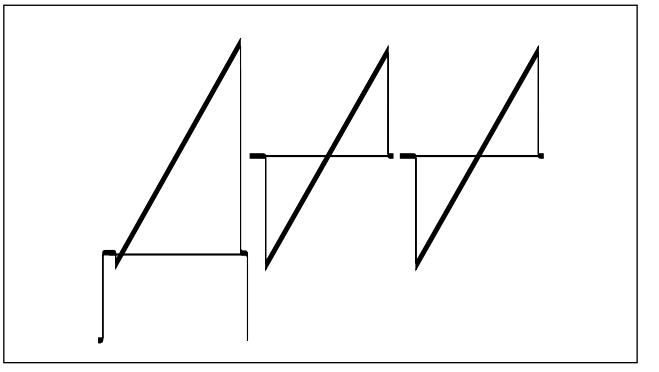
5 step



Multi Burst

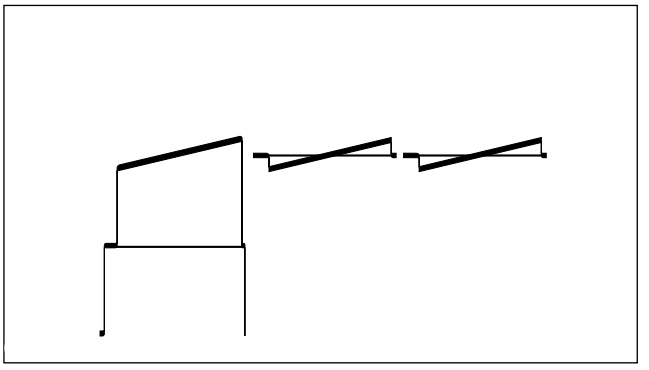


Ramp

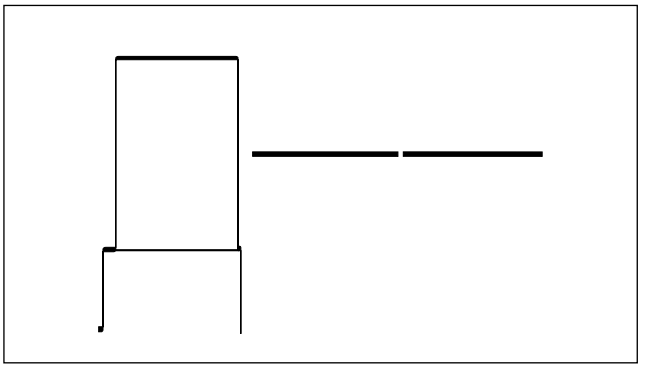


http://getMANUAL.com

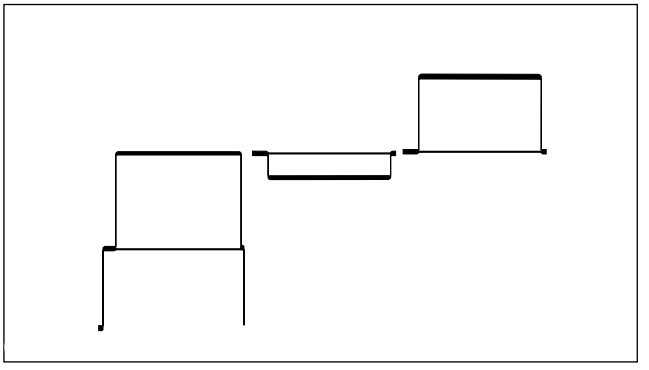
Shallow Ramp



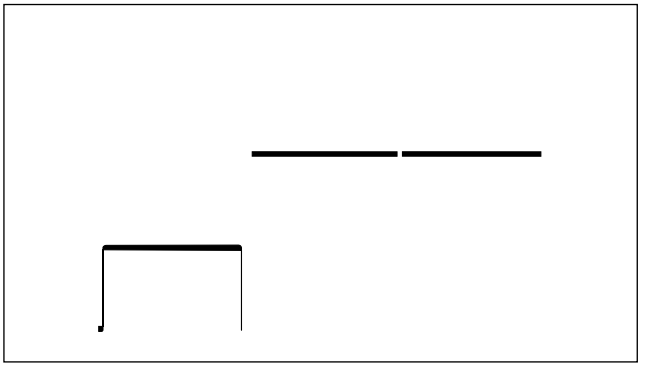
100% Flat



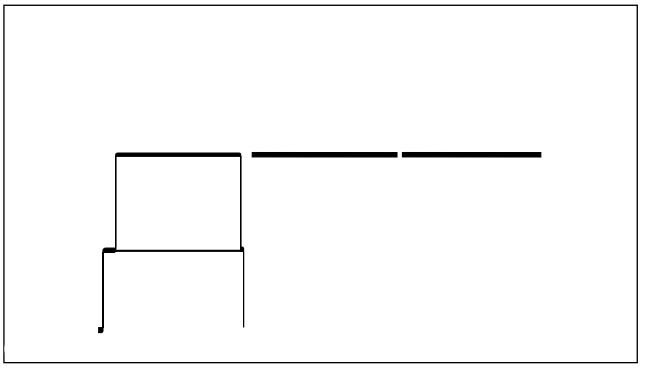
Red Signal



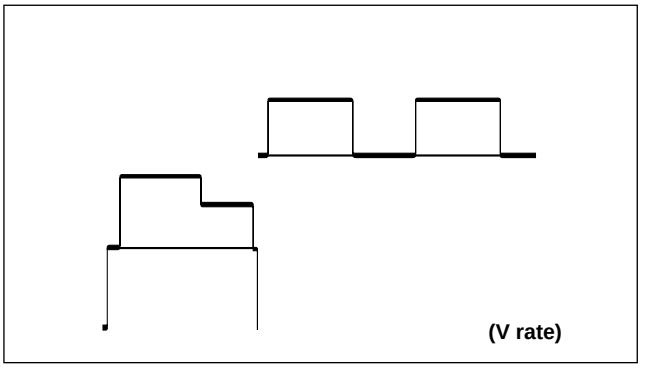
Black Burst



50% Flat

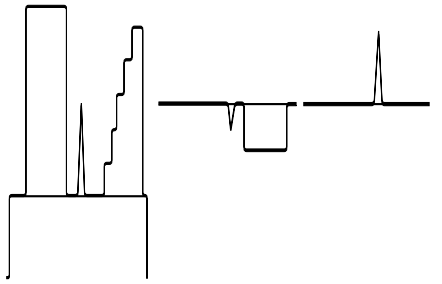


Pathological Check Code

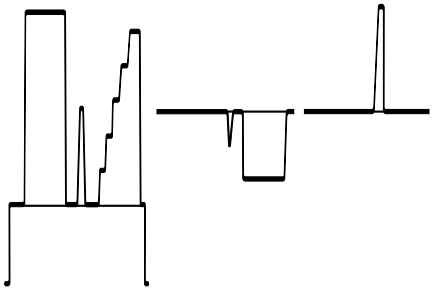


NTC7 (NTSC) (525/60 System only)

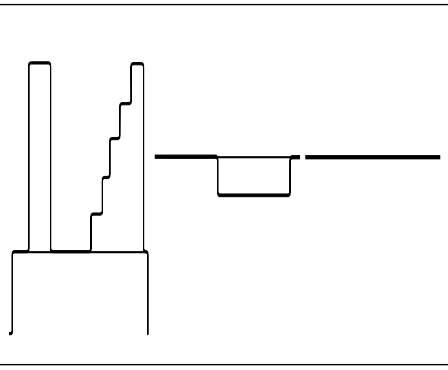
D-1 format



Betacam format



Line330 (625) (625/50 System only)



Section 3
Electrical Alignment

In Section 3 explains the electrical alignment for the DNW-A100/A50/A45 and DNW-A100P/A50P/A45P.
The following are the contents in Section 3.

Section title	Description
3-1. Power Supply Line Alignment	Explains the output voltage checks and adjustments for the power supply unit. After replacing the power supply unit, perform the checks. After repairing it, perform the checks and adjustments.
3-2. Dial Pulse Adjustment (PTC-69 Board)	Explains the adjustment for the PTC-69 board in the search dial assembly. After replacing or repairing this board, perform this section.
3-3. Demagnetization Head Driving Voltage Adjustment	Explains the driving voltage for the demagnetization head. (MS-50 board) After repairing the demagnetization head driving circuit on the MS-50 board, perform this section.
3-4. Servo System Alignment	Explains the alignment of the servo system for the VTR.
3-5. RF System Alignment (EQ-56 Board)	Explains the alignment of the RF system for the VTR. The substance to Section 3-5-3 is equal to “6-5-2. Electrical Adjustments” in “6-5. EQ-56 Board Replacement” of the maintenance manual part 1. **Note** Refer to Section 3-5-4 in order to perform the recording current adjustment independently of the standard RF system alignment.
3-6. Audio System Alignment (APR-12/13 Boards)	Explains the alignment of the audio system for the VTR. And describes on this section for the adjustments of the longitude audio PB block for the analog Betacam tape (Betacam/Betacam SP format) as well. There is no adjustment item for the digital audio system. Analog audio system is only required the adjustment in this VTR.
3-7. Video System Alignmnet (VPR-17 Board)	Explains the alignment of the video system in the VTR (except function by options). The substance of Section 3-7 is equal to “6-9-2. Electrical Adjustments” in “6-9. VPR-17 Board Replacement” of the maintenance manual part 1. **Note** For the video system of the analog Betacam PB, refer to Section 3-8.
3-8. Analog Betacam PB System Alignment	Explains the alignment of the video line in the analog Betacam PB system. **Note** For the adjustments of the longitude audio PB block for the analog Betacam tape (Betacam / Betacam SP format), refer to Section 3-6.
3-9. TBC Remote Control Offset Adjustment (FP-91 Board)	Explains the adjustments for the FP-91 board. Be sure to perform this adjustment when the CAV control circuit on the FP-91 board is repaired.
3-10. SDI/SDTI I/O Lines Adjustment (CP-297 Board)	Explains the adjustment of the SDI/SDTI input/output lines of the VTR (except function by options).
3-11. LTC Alignment and Full Erasure Current Check (TC-96 Board)	Explains the adjustment for the TC-96 board.

Note

See Section 4 for the following options.

Model name	Section	Remarks
BKDW-505/506	4-1	DEC-65 board
BKNW-103	4-2	CP-300 board
BKNW-104	4-3	AD-105 board (The substance of Section 4-3 is equal to “1-18-2. Adjustment after Installing” in Section 1-18 of the maintenance manual part 1.)
BKNW-105	4-4	DIF-44 and CP-308 boards (There is no adjustment item in those boards. Section 4-4 is described the function check as the substance of “1-19-2. Check after Installing” in Section 1-19 of the maintenance manual part 1.)

3-1. Power Supply Line Alignment

3-1-1. Output Voltage Check

When the power supply unit in the VTR was replaced, perform the output voltage check.

Note

Be sure to perform the check before reattaching the bottom plate.

Tool

- Digital voltmeter: ADVANTEST TR6845 or equivalent

Preparation

1. Wait more than 30 seconds after turning off the POWER switch.
2. Disconnect the power cord and all cables on connector panel.
3. Place the VTR on its right side panel down.
   Note
   Be careful not to shock the hard disk drive when laying the VTR.
4. When the bottom plate was reattached, remove it. (Refer to Section 2-3-1 of the maintenance manual part 1.)
5. Connect the power cord.
6. Wait for 10 minutes after turning on the POWER switch.

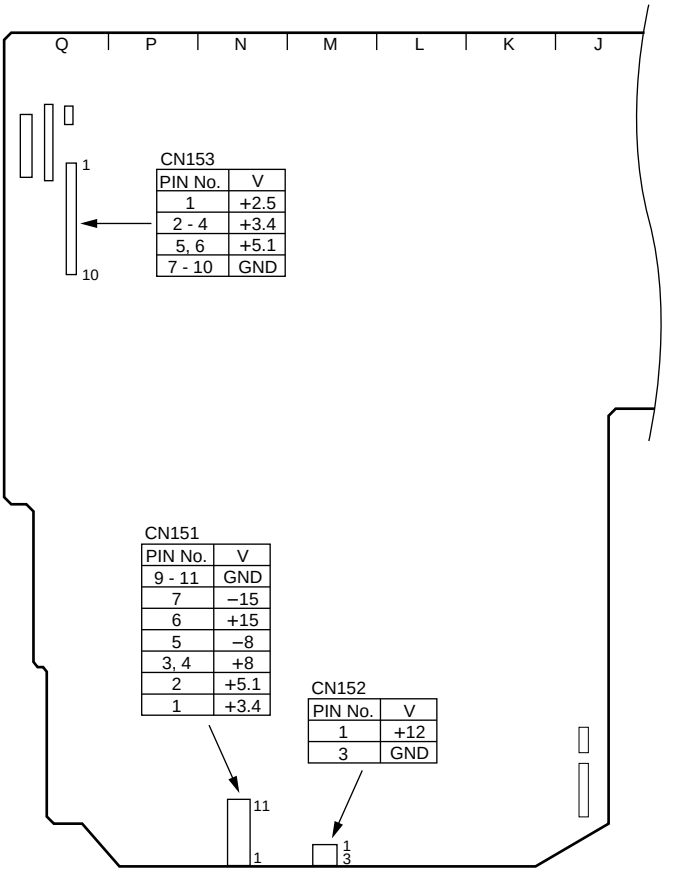
Voltage Check

Check each output voltage of power supply lines at the following points.

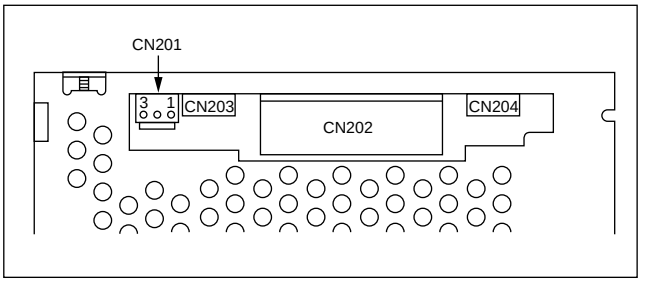
Line	Measurement point	Specification	Remarks
+3.4 V	CN151-1/MB-648(N-10)	+3.40 ±0.20 V	⊘
+5.1 V	CN151-2/MB-648(N-10)	+5.20 ±0.25 V	⊘
+8 V	CN151-3/MB-648(N-10)	+8.00 ±1.00 V	
−8 V	CN151-5/MB-648(N-10)	−8.00 ±1.00 V	
+15 V	CN151-6/MB-648(N-10)	+15.0 ±1.0 V	⊘
−15 V	CN151-7/MB-648(N-10)	−15.0 ±0.6 V	
+12 V	CN152-1/MB-648(M-10)	+12.0 ±0.6 V	⊘
+2.5 V	CN153-1/MB-648(Q-2)	+2.50 ±0.15 V	⊘
+18 V	CN201-1/MAIN2 **Note** Measure at the terminal contact of the connected harness wire (brown).	+18.0 ±2.0 V	

If the specification is not satisfy

- For the power lines with a ⊘-mark in remarks column of the above table: Can be adjusted the output voltage. Be sure to adjust with the power supply unit settled in adjustable condition referring to Section 3-1-2.
- For without a ⊘-mark in remarks column of the above table: Can not be adjusted the output voltage. Replace the power supply unit, or make sure that repair of this unit had been completed.



MB-648 Board (Side B)



CN201 of Power Supply Unit (MAIN2 Board)

3-1-2. Output Voltage Adjustment

When the power supply unit was repaired, perform the adjustment (check) under disclosing the power supply unit.

CAUTION

Since the primary circuit is exposed, be extremely careful with not to get an electric shock.
When completing the adjustments and checks, turn off the POWER switch without delay.

Tools List

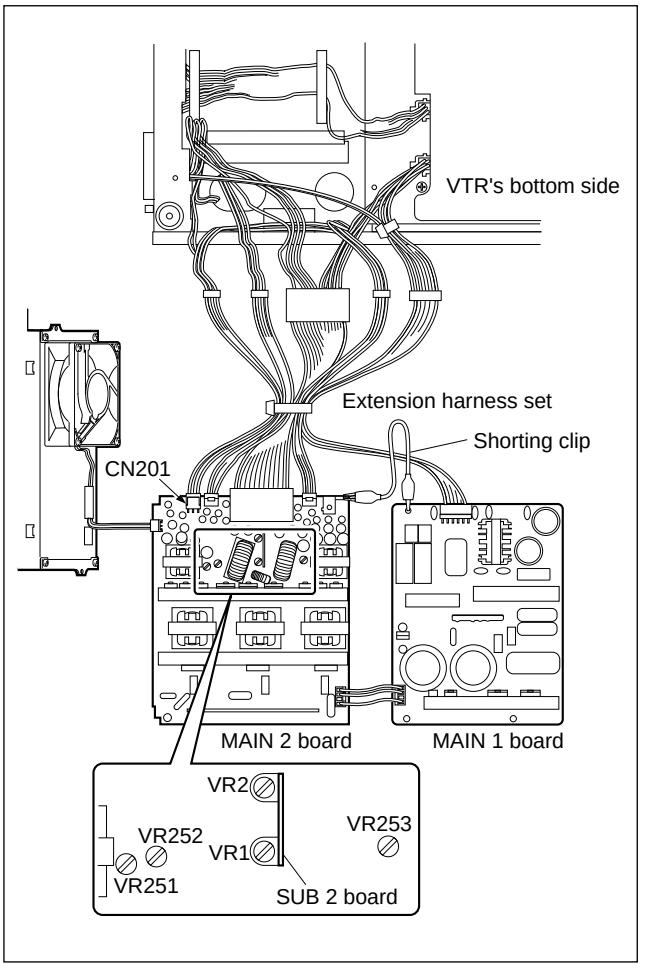
- Digital voltmeter: ADVANTEST TR6845 or equivalent
- Extension cable set (SONY part No. 1-957-071-11)
- Shorting clip

Preparation

1. Wait more than 30 seconds after turning off the POWER switch.
2. Disconnect the power cord and all cables on connector panel.
3. Remove the power supply unit.
   (Refer to Section 5-30.)
4. Reattach a power supply panel assembly under staying on the VTR's right side panel down.
   (Do not reattach the bottom plate.)
5. Connect five connectors of the extension cable set to each connector of the VTR's harnesses that were connected to the power supply unit before.
6. Take a power supply unit to pieces as figure of right.
   (Refer to the exploded views in Section 2 of the maintenance manual part 2, volume-2.)
7. Reconnect the MAIN1 board and MAIN2 board with a harness of the power supply unit.
8. Connect the five connectors of extension cable set to the MAIN1 board and MAIN2 board.

   Note

   Be sure to confirm that nothing is the cause of the short circuit under the MAIN1 and MAIN2 boards.
9. Connect both GND of the MAIN1 board and MAIN2 board with a shorting clip.
10. Connect the power cord.
11. Wait for 10 minutes after turning on the POWER switch.



Voltage Adjustment (Check)

Adjust and check each output voltage of power supply lines at the following points.

Line	Measurement point	Specification	Adjust. point
+3.4 V	CN151-1/MB-648(N-10)	+3.40 ±0.20 V	⊘VR252/MAIN2
+5.1 V	CN151-2/MB-648(N-10)	+5.20 ±0.25 V	⊘VR1/SUB2
+8 V	CN151-3/MB-648(N-10)	+8.00 ±1.00 V	Check only
–8 V	CN151-5/MB-648(N-10)	–8.00 ±1.00 V	Check only
+15 V	CN151-6/MB-648(N-10)	+15.0 ±1.0 V	⊘VR251/MAIN2
–15 V	CN151-7/MB-648(N-10)	–15.0 ±0.6 V	Check only
+12 V	CN152-1/MB-648(M-10)	+12.0 ±0.6 V	⊘VR253/MAIN2
+2.5 V	CN153-1/MB-648(Q-2)	+2.50 ±0.15 V	⊘VR2/SUB2
+18 V	CN201-1/MAIN2	+18.0 ±2.0 V	Check only

3-2. Dial Pulse Adjustment (PTC-69 Board)

When the PTC-69 board was replaced or the dial pulse generating circuit on the PTC-69 board was repaired, perform the dial pulse adjustment.

Note

Be sure to perform the adjustments with the search dial assembly separated from the lower control panel assembly. When uniting both assemblies, remove the search dial assembly from the lower control panel assembly as follows:

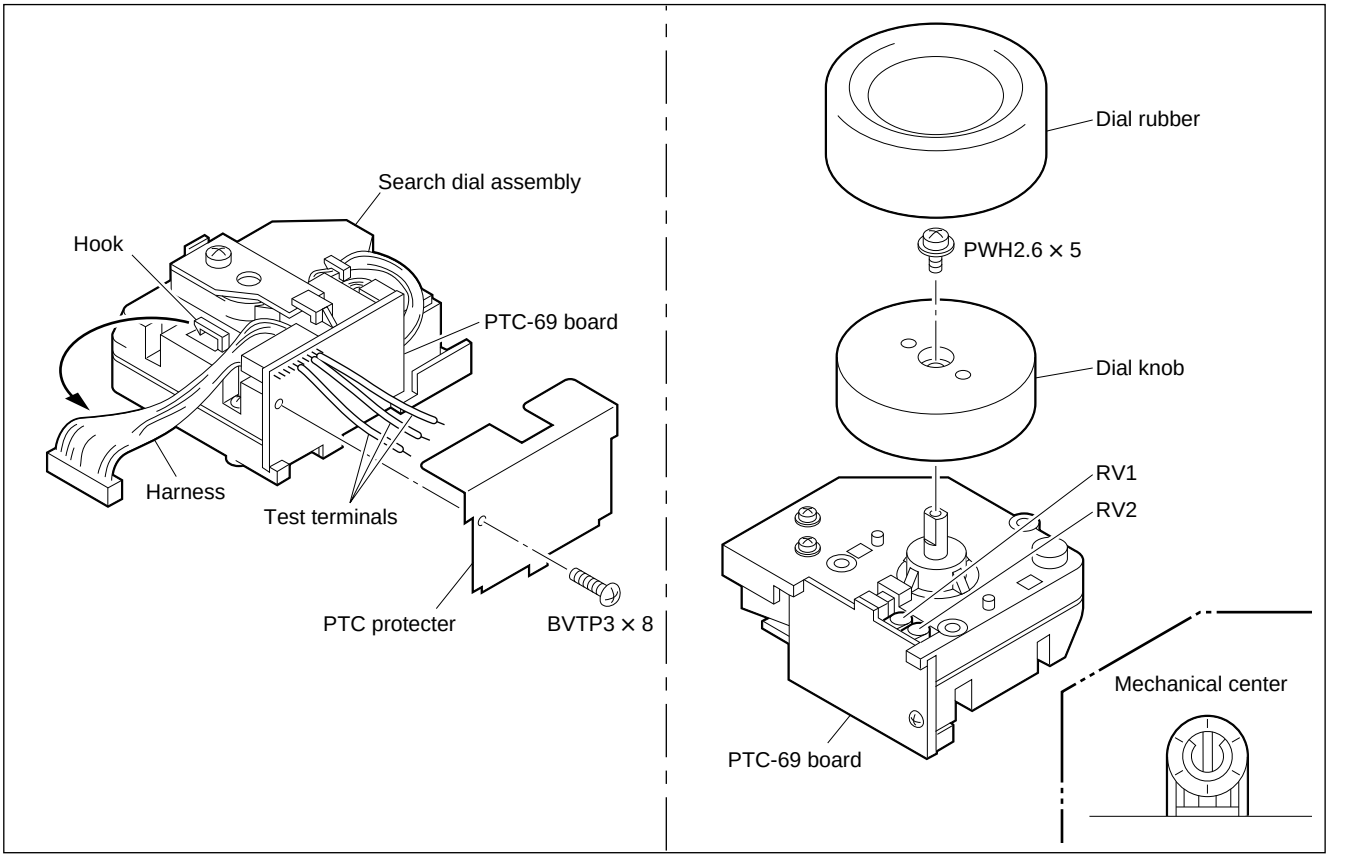
1. Remove a panel from the lower control panel assembly. (Refer to Section 2-3-2 of the maintenance manual part 1.)
2. Remove the dial rubber, dial knob, and search dial assembly from the lower control panel assembly. (Refer to the exploded views in Section 2 of the maintenance manual part 2, volume-2.)
3. Disconnect the harness from CN69 on the KY-364 board of the lower control panel assembly.

Tools List

- Oscilloscope: TEKTRONIX 2465B or equivalent
- Solder iron
- Test terminals, such as covered wire (3 pieces)

Preparation

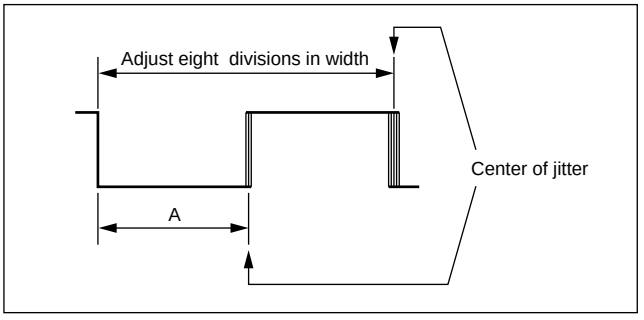
1. Remove the PTC protector after removing a screw.
2. Solder the three test terminals to the connector CN2's pins 2, 3 and 6 on side B of the PTC-69 board.
3. Fix the PTC-69 board with a screw that is removed at step 1 (without the PTC protector).
4. Attach the dial knob and dial rubber to the search dial assembly.
5. When the PTC-69 board is replaced, set RV1 and RV2 to the mechanical center.
   When the potentiometer RV1 or RV2 is replaced, set it (RV1 or RV2) to the mechanical center.
6. Connect the harness to CN69 of the KY-364 board with this harness unhooked.
7. Turn on the POWER switch after connecting the power cord.
8. To turn the search dial to JOG mode, press the JOG button.



Preparation

Adjustment (Check)

1. Connect the oscilloscope's CH-1 input as follows:
   X: Pin 2 of CN2 (soldered test terminal)
   G: Pin 6 of CN2 (soldered test terminal)
2. During turn the search dial at uniform speed and reverse direction (↺), adjust the sweep time on the oscilloscope to align the 1 cycle waveform to 8 divisions width.
3. During turn the search dial at the same as step 2, checks that the duty ratio on waveform satisfy the specification. If the specification is not satisfied, perform the adjustment.
   Adj. point: ⊘RV1/PTC-69 (inside RV)
   Specification: Duty ratio 0.50 ±0.04
   (A = 4.0 ±0.3 divisions width)
4. Connect the oscilloscope's CH-1 input as follows:
   X: Pin 3 of CN2 (soldered test terminal)
   G: Pin 6 of CN2 (soldered test terminal)
5. During turn the search dial at uniform speed and forward direction (↻), adjust the sweep time on the oscilloscope to align the 1 cycle waveform to 8 divisions width.
6. During turn the search dial at the same as step 5, checks that the duty ratio on waveform satisfy the specification. If the specification is not satisfied, perform the adjustment.
   Adj. point: ⊘RV2/PTC-69 (outside RV)
   Specification: Duty ratio 0.50 ±0.04
   (A = 4.0 ±0.3 divisions width)



Waveform on Oscilloscope

Perfection

1. Turn off the POWER switch.
2. Unsolder and remove the three test terminals from CN2 on the PTC-69 board.
3. Remove a screw fixing the PTC-69 board, then fix the PTC-69 board and PTC protector with removed screw.
4. Hook the harness that connected to the lower control panel assembly.
5. Remove the dial rubber and dial knob from the search dial assembly.
6. Reinstall the search dial assembly to the lower control panel assembly.
7. Reattach the panel on the lower control panel assembly.
8. Reattach the dial knob and dial rubber.

3-3. Demagnetization Head Driving Voltage Adjustment (MS-50 Board)

When the related circuit from RV901 to CN24 in the demagnetization head driving circuit on the MS-50 board was repaired, perform this adjustment.

Notes

Be sure to adjust with the hard disk drive unit removed.

- When turning on the power with it removed, the system error code D2 is displayed on the time data display area. Nevertheless, there is no problem in adjusting.
- When the hard disk drive unit was reinstalled, remove it referring to Section 5-31.

Tools List

- Digital voltmeter: ADVANTEST TR6845 or equivalent
- Betacam SP cassette tape (metal particle type)

  Note

  Never use the alignment tape because it may dwindle the magnetic potential of this tape.

Preparation

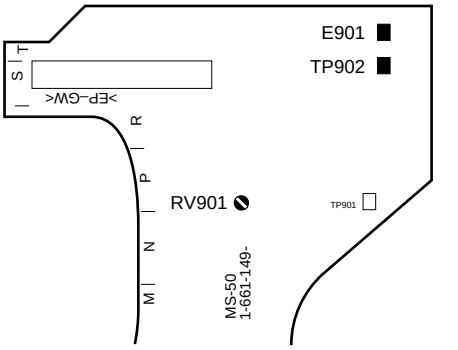
1. When the VTR is fallen sideways, replace it to normal.
2. Connect the power cord and turn on the POWER switch.
3. Insert the Betacam SP cassette tape (metal particle type).
4. Wait more than 30 seconds after turning off the POWER switch.
5. Place the VTR with its right side panel down.

Adjustment

1. Connect the digital voltmeter to TP902 (S-11) on the MS-50 board.
   GND: E1/MS-50 (C-11: in the suffix 11 or 12) or E901/MS-50 (T-11: in the suffix 13 or higher)
2. Turn on the POWER switch.
3. During play back the inserted cassette tape in PLAY mode, adjust so that the measuring voltage satisfy the specification.
   Adj. point: ⊘RV901/MS-50 (P/T-8)
   Specification: 180 $^{+5}_{-10}$ mV dc

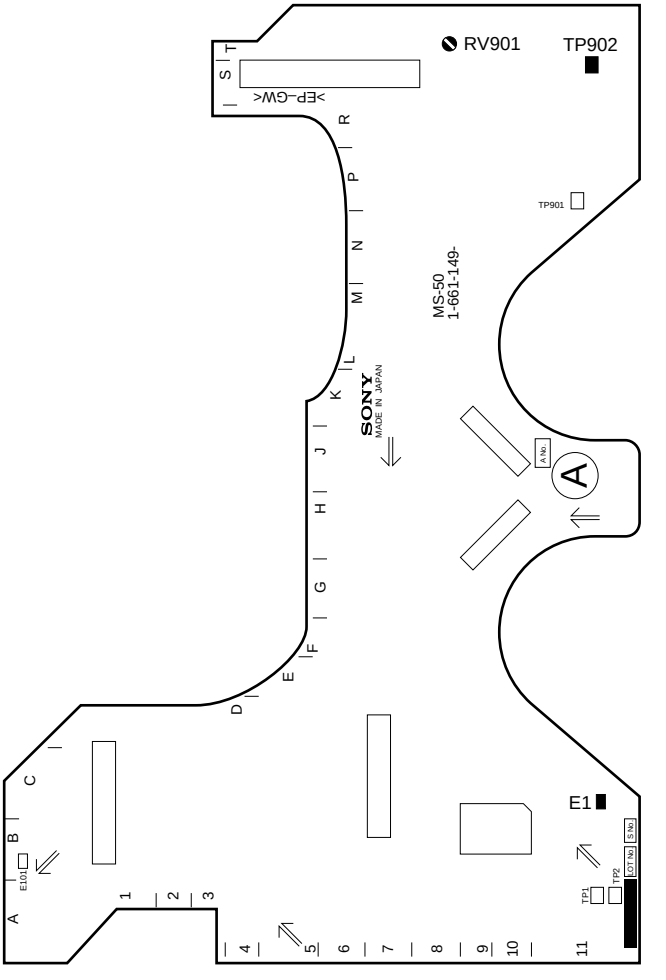
Perfection

1. Wait more than 30 seconds after turning off the POWER switch.
2. Reinstall the head disk drive unit. (Refer to Section 5-31.)
3. Reattach the bottom plate.
4. Replace the VTR to normal from falling sideways.
5. Turn on the POWER switch.
6. Eject the cassette tape.



For board No. suffixs 13 and higher

For board No. suffixs 11 and 12



MS-50 Board (Side A)

3-4. Servo System Alignment

3-4-1. Adjustment Overview

All the servo adjustments for the VTR are adjusted using the menus in the maintenance mode.
When the MS-50 board or IC9 (NV-RAM) on MS-50 board was replaced, be sure to initialize the NV-RAM referring to Section 3-4-2 before starting the adjustments of the servo system alignment.

Note

For detail of each menu in the maintenance mode, refer to Section 4 of the maintenance manual part 1.
The countermeasures against the malfunction of an automatic adjustment (an error message "ADJUST IN-COMPLETE" will be displayed on the video monitor) had been described there.

Tools List

To perform the servo system alignment for the VTR, prepare the following equipment and fixtures.

- Alignment tapes for DNW-A100/A50/A45:
  SR2-1 (Part No. 8-960-075-11),
  SR2-1P (Part No. 8-960-075-61) ,
  and CR2-1B (Part No. 8-960-096-01)
- Alignment tapes for DNW-A100/A50/A45:
  SR2-1 (Part No. 8-960-075-11),
  SR2-1P (Part No. 8-960-075-61) ,
  and CR2-1B PS (Part No. 8-960-096-51)
- Analog composite video monitor
  (NTSC/PAL switchable type)

Note

This monitor is for menu displaying. Be sure to connect it to VIDEO OUTPUT COMPOSITE 3 (SUPER) connector.

Adjustment Items

Section	Item (Section title)		Adjustment point	Remarks
3-4-2	Servo adjustment data initialization		S101/SS-63	Perform Section 3-4-2 only when replacing the MS-50 board or NV-RAM (IC9/MS-50).
3-4-3	Servo continuity automatic adjustment		A000 : A001-A008 ADJ.	S reel FG duty adjustment (A001) T reel FG duty adjustment (A002) Capstan FG duty adjustment (A003) S reel offset/friction adjustment (A004) T reel offset/friction adjustment (A005) S reel torque adjustment (A006) T reel torque adjustment (A007) S/T reel tension offset adjustment (A008)
		Data save	A012 : NV-RAM CONTROL	
3-4-4	Capstan free speed adjustment		A010 : CAPSTAN FREE SPEED	Perform the adjustment and data saving in both
		Data save	A012 : NV-RAM CONTROL	525/60 and 625/50 systems.
3-4-5	RF switching position adjustment		A011 : RE SWITCHING POS.	Perform the adjustment and data saving in both
		Data save	A012 : NV-RAM CONTROL	525/60 and 625/50 systems.

3-4-2. Servo Adjustment Data Initialization

After replacing the MS-50 board or IC9 (NV-RAM) on MS-50 board, have to initialize the servo adjustment data stored the NV-RAM on MS-50 board.
Can to initialize in the following procedure.

How to initialize

With S101/SS-63(F-1) pressing, turn on the POWER switch.
Before releasing S101, wait three seconds after the power-on.

Note

If the system error (ERROR-97) occurs at this time, turn off the power and retry.

3-4-3. Servo Continuity Automatic Adjustment

1. To enter the maintenance mode, press S1101(G-1) on the SS-63 board.
2. Enter A000 : A001-A008 ADJ. in the maintenance mode.
3. To execute this adjustment, press the SET button once on the lower control panel.
   - The execution time is about 150 seconds.
   - Message “ADJUST COMPLETE” is displayed on the video monitor when this automatic adjustment is completed normally.
4. To exit the this menu, press the MENU button once on the lower control panel.

Data save (Store the adjusted data)

Note

Do not save the adjustment data if the automatic adjustment was not completed normally.

5. Enter A012 : NV-RAM CONTROL, then execute “SAVE SERVO ADJUST DATA”.
   - Message “DATA SAVED” is displayed on the video monitor when this data save is completed normally.

6. To exit the maintenance mode, press the MENU button five times.

3-4-4. Capstan Free Speed Adjustment

Prepare the following three alignment tapes to perform this adjustment.

- SR2-1 (for 525/60 system)
- SR2-1P (for 625/50 system)
- CR2-1B (for DNW-A100/A50/A45 only)
- CR2-1B PS (for DNW-A100P/A50P/A45P only)

Adjustment in 525/60 (or 625/50) System

1. To enter the maintenance mode, press S1101(G-1) on the SS-63 board.
2. Enter A010 : CAPSTAN FREE SPEED in the maintenance mode.
3. Insert the alignment tape SR2-1 (or SR2-1P), then the adjustment is executed automatically.
   - Message “ADJUST COMPLETE” is displayed on the video monitor when this automatic adjustment is completed normally.
4. To exit this menu, press the MENU button once.

For DNW-A100/A50/A45 in 525/60 system or the DNW-A100P/A50P/A45P in 625/50 system, perform steps 5 through 9 only.

5. To exit A00-01 : SERVO ADJUST, press the MENU button once.
6. Enter A00-01 : SERVO ADJUST again.
   - The alignment tape is ejected.
7. Enter A010 : CAPSTAN FREE SPEED again.
8. Insert the following alignment tape, then the adjustment is executed automatically.
   DNW-A100/A50/A45: CR2-1B
   DNW-A100P/A50P/A45P: CR2-1B PS
   - Message “ADJUST COMPLETE” is displayed on the video monitor when this automatic adjustment is completed normally.
9. To exit this menu, press the MENU button once.

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Data save (store the adjusted data)

Note

Do not save the adjustment data if the automatic adjustment was not completed normally.

10. Enter A012 : NV-RAM CONTROL, then execute "SAVE SERVO ADJUST DATA".
    - Message "DATA SAVED" is displayed on the video monitor when this data save is completed normally.

11. To exit the maintenance mode, press the MENU button five times.
12. Eject the alignment tape.

Adjustment in 625/50 (or 525/50) System

13. Change the video system of the VTR using the setup menu ITEM-013: 525/625 SYSTEM SELECT. (Refer to Section 7-2-2 of the operation manual.)
14. Perform the same as steps 1 through 12.
15. Return the operation system of the VTR to the customer setting in the setup menu ITEM-013.

Note

When performing Section 3-4-5, it is not necessary this step 15.

3-4-5. RF Switching Position Adjustment

Prepare the following alignment tapes to perform this adjustment.

- SR2-1 (for 525/60 system)
- SR2-1P (for 625/50 system)

Adjustment in 525/60 (or 625/50) System

1. Insert the alignment tape SR2-1 (SR2-1P), then advances it to the time code 00:25:00:00.
2. To enter the maintenance mode, press S1101(G-1) on the SS-63 board.
3. Enter A011 : RF SWITCHING POS. in the maintenance mode.
   - The alignment tape is ejected on the way to menu A011.
4. Insert this alignment tape again, then the adjustment is executed automatically.
   - Message "ADJUST COMPLETE" is displayed on the video monitor when this automatic adjustment is completed normally.
5. To exit this menu, press the MENU button once.

Data save (Store the adjusted data)

Note

Do not save the adjustment data if the automatic adjustments was not completed normally.

6. Enter A012 : NV-RAM CONTROL, then execute "SAVE SERVO ADJUST DATA".
   - Message "DATA SAVED" is displayed on the video monitor when this data save is completed normally.

7. To exit the maintenance mode, press the MENU button five times.
8. Eject the alignment tape.

Adjustment in 625/50 (or 525/50) System

9. Change the video system of the VTR using the setup menu ITEM-013: 525/625 SYSTEM SELECT. (Refer to Section 7-2-2 of the operation manual.)
10. Perform the same as steps 1 through 8.
11. Return the operation system of the VTR to the customer setting in the setup menu ITEM-013.

3-5. RF System Alignment (EQ-56 Board)

3-5-1. Adjustment Overview

There are the following in the RF system of the VTR.
- Record system of the Betacam SX format
- Playback system of the Betacam SX format
- Playback system of the Betacam / Betacam SP format

For the RF adjustment for the Betacam SX format (record and playback), perform the automatic adjustments in the menu of the maintenance mode.
For the Betacam / Betacam SP format, perform the manually adjustments in the menu of the maintenance mode.

For the DNW-A100/A50/A45's Betacam / Betacam SP PB function, be sure to adjust in the 525/60 system.
For the DNW-A100P/A50P/A45P's Betacam / Betacam SP PB function, be sure to adjust in the 625/50 system.
If differing, should change the video system in the setup menu ITEM-013 before adjusting. (For the ITEM-013, refer to Section 7-2-2 of the operation manual.)

Note

For detail of each menu in the maintenance mode, refer to Section 4 of the maintenance manual part 1.
The countermeasures against the malfunction of an automatic adjustment (an error message "Auto Adjust Failure" or "Condition NG" will be displayed on the video monitor) had been described there.

Tools List

To perform the RF system alignment for the VTR, prepare the following equipment and fixtures.

- Oscilloscope: TEKTRONIX 2465B or equivalent
- Analog composite video monitor

  Note

  This monitor is for menu displaying. Be sure to connect it to VIDEO OUTPUT COMPOSITE 3 (SUPER) connector.
- Extension board: EX-377 (Part No. J-6269-810-A)
  (for the extension of DM-89 board)
- Cleaning tape: BCT-5CLN (Sony's standard products)
- Alignment tapes for DNW-A100/A50/A45:
  SR5-1 (Part No. 8-960-075-01),
  CR5-1B (Part No. 8-960-096-41), and
  CR5-2A (Part No. 8-960-097-44)
- Alignment tapes for DNW-A100P/A50P/A45P:
  SR5-1P (Part No. 8-960-075-51),
  CR5-1B PS (Part No. 8-960-096-91),
  and CR5-2A PS (Part No. 8-960-098-44)
- Recording tape: BCT-SX series (Betacam SX cassette)
  (Sony's standard products)

  Note

  For this recording tape, prepare the virgin tape or no recorded tape that erased using the tape eraser, etc. in advance.

Adjustment Items

Section	Item (Section title) and Adjustment point	Measurement point
3-5-2	Betacam SX format overall RF system adjustment	
	For DNW-A100/A100P A17 : A10-A16 ALL ADJUST (Automatic adjustments)	
	For DNW-A50/A45/A50P/A45P A17 : A11-A16 ALL ADJUST (Automatic adjustments)	
	Data save A1F : NV-RAM CONTROL	
3-5-3	Betacam / Betacam SP format PB system (EQ RF output level) adjustment	
	METAL Y A30 : EQ VR : RF GAIN METAL-Y-A A30 : EQ VR : RF GAIN METAL-Y-B	TP100/DM-89
	METAL C A30 : EQ VR : RF GAIN METAL-C-A A30 : EQ VR : RF GAIN METAL-C-B	TP300/DM-89
	OXIDE C A30 : EQ VR : RF GAIN OXIDE-C-A A30 : EQ VR : RF GAIN OXIDE-C-B	TP300/DM-89
	OXIDE Y A30 : EQ VR : RF GAIN OXIDE-Y-A A30 : EQ VR : RF GAIN OXIDE-Y-B	TP100/DM-89
	Data save A3F : NV-RAM CONTROL	

Refer to Section 3-5-4 in order to adjust the recording current only.

Section	Item (Section title) and Adjustment point	Remarks
3-5-4	Recording current adjustment	
	A12 : REC CURRENT	(Automatic adjustment)
	Data save A1F : NV-RAM CONTROL	

3-5-2. Betacam SX Format Overall RF System Adjustment

Preparing tools

- Analog composite video monitor

Note

This monitor is for menu displaying. Be sure to connect it to VIDEO OUTPUT COMPOSITE 3 (SUPER) connector.

- Alignment tape for DNW-A100/A50/A45:
  SR5-1 (Part No. 8-960-075-01)
- Alignment tape for DNW-A100P/A50P/A45P:
  SR5-1P (Part No. 8-960-075-51)
- Recording tape: BCT-SX series (Betacam SX cassette)
  (Sony's standard products)

Note

For this recording tape, prepare the virgin tape or no recorded tape that erased using the tape eraser, etc. in advance.

Preparation

1. Clean the video heads.

(Refer to "5-2-3. Tape Running Surface of Upper Drum and Video Heads Cleaning" of the maintenance manual part 1.)

Note

Perform the cleaning under the power off.

2. Check the settings of the sub control panel.

CHARACTER switch ⇨ ON
REC INHIBIT switch ⇨ OFF

3. Check that the VTR has warmed up.

Before starting the adjustment, warm up the VTR through the power for 20 minutes or more.

Notice on the automatic adjustment

- Be sure not to touch the search dial and buttons which have an effect on tape running during the automatic adjustment mode. If tape running condition is changed, optimum adjustment can not be performed, the automatic adjustment operation may freeze, or the result of automatic adjustment become "FAIL" or "NG".
- If the adjustment with the automatic adjustment mode does not complete properly (an error message "Auto Adjust Failure" or "Condition NG" will be displayed on the video monitor), refer to "For Condition NG / Automatic Adjustment Failure" in Section 4-2-8 of the maintenance manual part 1.

Overall RF System Adjustment

1. Insert the alignment tape SR5-1 or SR5-1P, then search it in time code 00:01:00.
2. To enter the maintenance mode, press S1101 (G-1) of the SS-63 board.

PB system adjustment

3. Enter A17 : A10-A16 ALL ADJUST (A11-A16 ALL ADJUST) in the maintenance mode.
   - Message "Auto Adjust (Press SET)" is displayed on the video monitor.
4. To execute the automatic adjustments for PB system, press the SET button once on the lower control panel.
   - Message "Set a blank tape and press SET button for REC CURRENT adjustment" is displayed on the video monitor when the PB system adjustments are completed normally.
5. To eject the alignment tape, press the SET button once.
6. Take out this tape.

REC system adjustment (Rec. current adjustment)

7. Insert the recording tape.
8. To execute the automatic adjustment for the recording current, press the SET button once.
   - Message "Auto Adjust Complete" is displayed on the video monitor when this adjustment is completed normally.
9. To exit the maintenance mode, press the MENU button four times.
10. Eject the recording tape.

Data save (Store the adjusted data)

Note

Do not save the adjustment data if the automatic adjustments was not completed normally.

11. To enter the maintenance mode, press S1101(G-1) on the SS-63 board.
12. Enter A1F : NV-RAM CONTROL, then execute "SAVE ALL ADJUST DATA".
    - Message "Save Complete" is displayed on the video monitor when this data save is completed normally.

Note

When loading the previous data without save the current adjusted data, execute "ALL DATA PREVIOUS".

13. To exit the maintenance mode, press the MENU button four times.

3-5-3. Betacam / Betacam SP Format PB System (EQ RF Output Level) Adjustment

Preparing tools

- Oscilloscope: TEKTRONIX 2465B or equivalent
- Analog composite video monitor

Note

This monitor is for menu displaying. Be sure to connect it to VIDEO OUTPUT COMPOSITE 3 (SUPER) connector.

- Extension board: EX-377 (Part No. J-6269-810-A)
- Alignment tapes for DNW-A100/A50/A45:
  CR5-1B (Part No. 8-960-096-41)
  and CR5-2A (Part No. 8-960-097-44)
- Alignment tapes for DNW-A100P/A50P/A45P:
  CR5-1B PS (Part No. 8-960-096-91)
  and CR5-2A PS (Part No. 8-960-098-44)

Preparation

1. Extend the DM-89 board with an extension board EX-377.

Note

Wait for 30 seconds after turning off the power, then remove the DM-89 board.

2. Check the setting of the sub control panel.

CHARACTER switch ⇨ ON

3. Check the video system.

Check that the video system is setting as follows:
DNW-A100/A50/A45: 525/60 system
DNW-A100P/A50P/A45P: 625/50 system
If differed, change the operation system in the setup menu ITEM-013 before adjusting. (For the ITEM-013, refer to Section 7-2-2 of the operation manual.)

4. Check that the equipment has warmed up.

Before starting the adjustment, warm up the VTR and equipment through the power for 20 minutes or more.

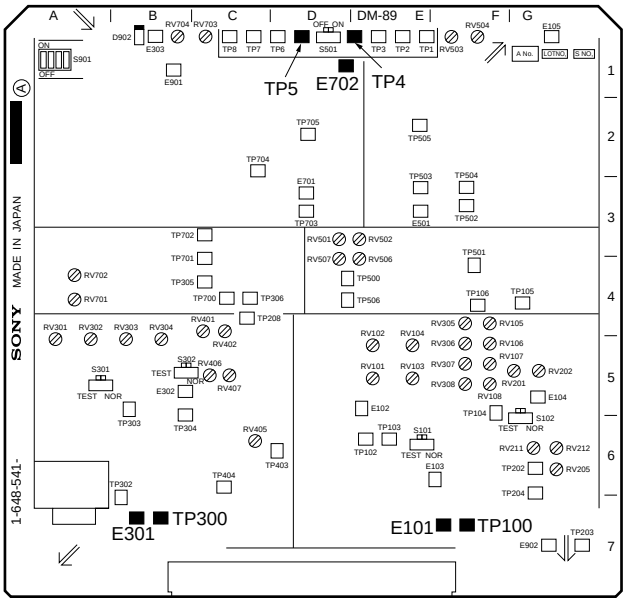
How to change the data

(1) Set the ∗ mark on the video monitor to the line to be changed the data by turning the search dial.
(In the time data display area of the VTR, display the item by turning it, “RF G M-Y-A” for example.)
(2) To change the data, turn the search dial with the JOG button pressing.

EQ Output Level Adjustment

1. To enter the maintenance mode, press S1101(G-1) on the SS-63 board.
2. Enter A3 : BETACAM PB ADJUST in the maintenance mode.
3. Enter A30 : EQ VR.
4. Set the following data to all the items of A30 : EQ VR.

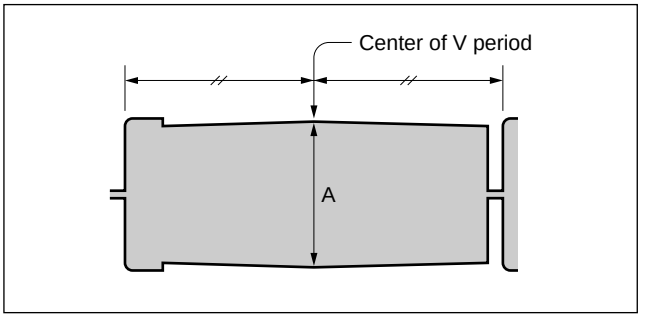
Item (A30 : EQ VR)	Setting data for DNW-A100/A50 /A45	Setting data for DNW-A100P/ A50P/A45P
RF GAIN METAL-Y-A	55	8E
RF GAIN METAL-Y-B	55	8E
RF GAIN METAL-C-A	3F	6C
RF GAIN METAL-C-B	3F	6C
RF GAIN OXIDE-Y-A	72	9C
RF GAIN OXIDE-Y-B	72	9C
RF GAIN OXIDE-C-A	5A	81
RF GAIN OXIDE-C-B	5A	81



DM-89 Board (Side A)

METAL Y adjustment

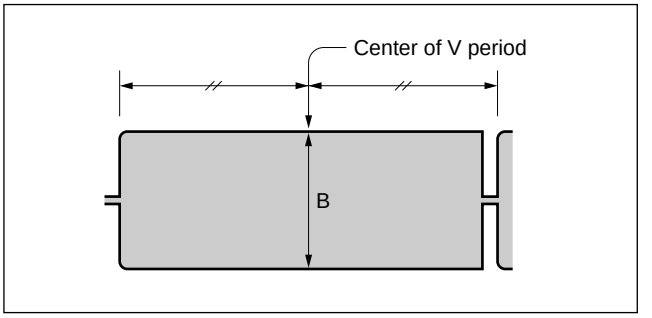
5. Connect and set the oscilloscope as follows:
   Band width limit: ON
   CH-1: TP100/DM-89(F-7), GND: E101/DM-89(F-7)
   AC 100 mV/DIV
   CH-2: TP4/DM-89(E-1), GND: E702/DM-89(D-1)
   DC 1 V/DIV
   TIME: 2 ms/DIV
   TRIG: CH-2
6. To perform the tape operation, press the SET button once on the lower control panel.
7. Play back the flat field signal portion (24:00 to 26:00) of the following alignment tape in PLAY mode.
   For DNW-A100/A50/A45: CR5-1B
   For DNW-A100P/A50P/A45P: CR5-1B PS
8. To operate the maintenance mode, press the MENU button on the lower control panel.
9. Set the oscilloscope's trigger to the − slope, then adjust the level of METAL Y-A (ch-A of METAL Y).
   Adj. point: A30 : EQ VR : RF GAIN METAL-Y-A
   Specification: A = 380 ±20 mV p-p
10. Set the oscilloscope's trigger to the + slope, then adjust the level of METAL Y-B (ch-B of METAL Y).
    Adj. point: A30 : EQ VR : RF GAIN METAL-Y-B
    Specification: A = 380 ±20 mV p-p
11. While switching the polarity (−/+) of the oscilloscope's trigger slope, fine adjust the level difference between the METAL Y-A and METAL Y-B until they are identical amplitude.



12. To perform the tape operation, press the SET button once.
13. Stop the playback of the alignment tape.

METAL C adjustment

14. Change the connection of the oscilloscope as follows: (Keep the setting of the oscilloscope.)
    CH-1: TP300/DM-89(B-7), GND: E301/DM-89(B-7)
    CH-2: TP5/DM-89(D-1), GND: E702/DM-89(D-1)
15. Play back the flat field signal portion (24:00 to 26:00) of the alignment tape CR5-1B / CR5-1B PS in PLAY mode.
16. To operate the maintenance mode, press the MENU button once.
17. Set the oscilloscope's trigger to the − slope, then adjust the level of METAL C-A (ch-A of METAL C).
    Adj. point: A30 : EQ VR : RF GAIN METAL-C-A
    Specification: B = 380 ±20 mV p-p
18. Set the oscilloscope's trigger to the + slope, then adjust the level of METAL C-B (ch-B of METAL C).
    Adj. point: A30 : EQ VR : RF GAIN METAL-C-B
    Specification: B = 380 ±20 mV p-p
19. While switching the polarity (−/+) of the oscilloscope's trigger slope, fine adjust the level difference between the METAL C-A and METAL C-B until they are identical amplitude.



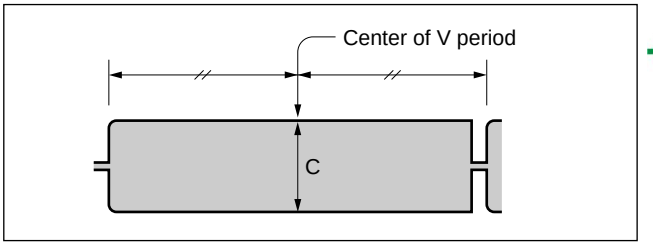
20. To perform the tape operation, press the SET button once.
21. Stop the playback of the alignment tape, then eject it.

OXIDE C adjustment

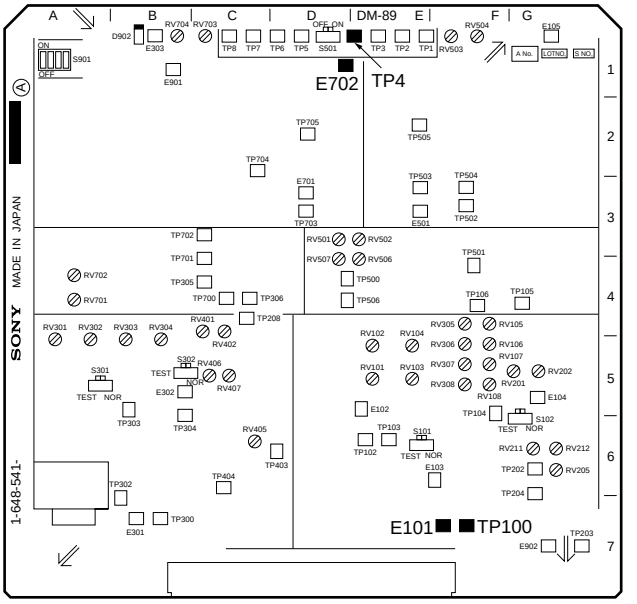
Note

The connections and settings of the oscilloscope are the same as “METAL C Adjustment”.

22. Play back the 75% color-bar signal portion (0:00 to 3:00) of the following alignment tape in PLAY mode.
    For DNW-A100/A50/A45: CR5-2A
    For DNW-A100P/A50P/A45P: CR5-2A PS
23. To operate the maintenance mode, press the MENU button once.
24. Set the oscilloscope’s trigger to the − slope, then adjust the level of OXIDE C-A (ch-A of OXIDE C).
    Adj. point: A30 : EQ VR : RF GAIN OXIDE C-A
    Specification: C = 250 ± 20 mV p-p
25. Set the oscilloscope’s trigger to the + slope, then adjust the level of OXIDE C-B (ch-B of OXIDE C).
    Adj. point: A30 : EQ VR : RF GAIN OXIDE C-B
    Specification: C = 250 ± 20 mV p-p
26. While switching the polarity (−/+) of the oscilloscope’s trigger slope, fine adjust the level difference between the OXIDE C-A and OXIDE C-B until they are identical amplitude.



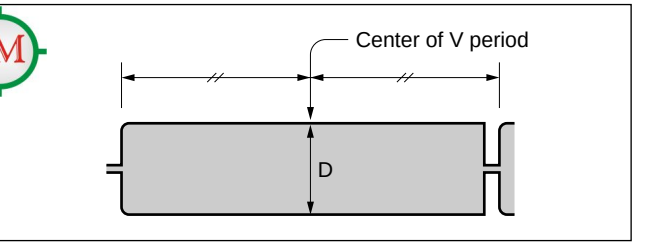
27. To perform the tape operation, press the SET button once.
28. Stop the playback of the alignment tape.



DM-89 Board (Side A)

OXIDE Y adjustment

29. Change the connection of the oscilloscope as follows: (Keep the setting of the oscilloscope.)
    CH-1: TP100/DM-89(F-7), GND: E101/DM-89(F-7)
    CH-2: TP4/DM-89(E-1), GND: E702/DM-89(D-1)
30 Play back the 75% color-bar signal portion (0:00 to 3:00) of the alignment tape CR5-2A / CR5-2A PS in PLAY mode.
31. To operate the maintenance mode, press the MENU button once.
32. Set the oscilloscope’s trigger to the − slope, then adjust the level of OXIDE Y-A (ch-A of OXIDE Y).
    Adj. point: A30 : EQ VR : RF GAIN OXIDE Y-A
    Specification: D = 250 ± 20 mV p-p
33. Set the oscilloscope’s trigger to the + slope, then adjust the level of OXIDE Y-B (ch-B of OXIDE Y).
    Adj. point: A30 : EQ VR : RF GAIN OXIDE Y-B
    Specification: D = 250 ± 20 mV p-p
34. While switching the polarity (−/+) of the oscilloscope’s trigger slope, fine adjust the level difference between the OXIDE Y-A and OXIDE Y-B until they are identical amplitude



35. To perform the tape operation, press the SET button once.
36. Stop the playback of the alignment tape, then eject it.
37. To operate the maintenance mode, press the MENU button once.
38. To exit A30 : EQ VR, press the MENU button once.

Data save (Store the adjusted data)

39. Enter A3F : NV-RAM CONTROL, then execute “SAVE ALL ADJUST DATA”.
    - Message “Save Complete” is displayed on the video monitor when this data save is completed normally.

    Note

    When loading the previous data without save the current adjusted data, execute “ALL DATA PREVIOUS”.

40. To exit the maintenance mode, press the MENU button four times.

3-5-4. Recording Current Adjustment

When the recording current adjustment is performed independently of the standard RF system alignment, be sure to see Section 3-5-4.
(Refer to Section "3-5-2. Betacam SX Format Overall RF System Adjustment" regarding the standard recording current adjustment in the RF system adjustment.)

Preparing tools

- Analog composite video monitor

  Note

  This monitor is for menu displaying. Be sure to connect it to VIDEO OUTPUT COMPOSITE 3 (SUPER) connector.
- Cleaning tape: BCT-5CLN (Sony's standard products)
- Recording tape: BCT-SX series (Betacam SX cassette) (Sony's standard products)

  Note

  For this recording tape, prepare the virgin tape or no recorded tape that erased using the tape eraser, etc. in advance.

Preparation

1. Clean with the cleaning tape.

(Refer to "5-2-1. Cleaning by Cleaning Tape" of the maintenance manual part 1.)

2. Check the settings of the sub control panel.

CHARACTER switch ⇨ ON
REC INHIBIT switch ⇨ OFF

3. Check that the VTR has warmed up.

Before starting the adjustment, warm up the VTR through the power for 20 minutes or more.

Notice on the automatic adjustment

- Be sure not to touch the search dial and buttons which have an effect on tape running during the automatic adjustment mode. If tape running condition is changed, optimum adjustment can not be performed, the automatic adjustment operation may freeze, or the result of automatic adjustment become "FAIL" or "NG".
- If the adjustment with the automatic adjustment mode does not complete properly (an error message "Auto Adjust Failure" or "Condition NG" will be displayed on the video monitor), refer to "For Condition NG / Automatic Adjustment Failure" in Section 4-2-8 of the maintenance manual part 1.

Recording Current Adjustment

1. Insert the recording tape.
2. To enter the maintenance mode, press S1101(G-1) on the SS-63 board.
3. Enter A12 : REC CURRENT in the maintenance mode.
   - Message "Auto Adjust (Press SET)" is displayed on the video monitor.
4. Check that there is the ∗ mark to "ALL" on the video monitor.
   If not, set the ∗ mark to "ALL" with the search dial turned.
5. To execute the automatic adjustment for the recording current, press the SET button once on the lower control panel.
   - Message "Auto Adjust Complete" is displayed on the video monitor when this adjustment is completed normally.
6. To exit the maintenance mode, press the MENU button four times.
7. Eject the recording tape.

Data save (Store the adjusted data)

Note

Do not save the adjustment data if the automatic adjustments was not completed normally.

8. To enter the maintenance mode, press S1101(G-1) on the SS-63 board.
9. Enter A1F : NV-RAM CONTROL, then execute "SAVE ALL ADJUST DATA".
   - Message "Save Complete" is displayed on the video monitor when this data save is completed normally.

   Note

   When loading the previous data without save the current adjusted data, execute "ALL DATA PREVIOUS".

10. To exit the maintenance mode, press the MENU button four times.

3-6. Audio System Adjustment (APR-12/13 Boards)

3-6-1. Adjustment Overview

In the audio system alignment for the VTR need to adjust the analog audio system only. For the digital audio system is not needed.
For the VTR equipped with AES/EBU I/F kit BKNW-105 (option), the adjustment in Sections 3-6-3 to 3-6-5 and 3-6-8 are not needed.

Notes

- When the analog audio CH1/2/3/4 inputs/outputs are restored after removing the BKNW-105, perform the adjustments (or checks) for the analog audio CH1/2/3/4 input/output lines.
- For the DIF-44 board and CP-308 board of the BKNW-105, there is not adjustment item.
  However, the function check procedure for the BKNW-105 is explained to Section 4-4.

Tools List

To perform the audio system alignment for the VTR, prepare the following equipment and fixtures.

- Audio signal generator:
  TEKTRONIX SG505-option 02 or equivalent

  Note

  For the VTR equipped with BKNW-105 (optional kit), the audio signal generator is not required.
- Audio analyzer: TEKTRONIX AA501A-option 02 or equivalent
- Audio level meter: HEWLETT-PACKARD HP3400A or equivalent
- Oscilloscope: TEKTRONIX 2465B or equivalent
- Extension board: EX-556 (Part No. A-8277-212-A)
- Shorting clip
- Alignment tape for DNW-A100/A50/A45:
  CR8-1A (Part No. 8-960-097-45)
- Alignment tapes for DNW-A100P/A50P/A45P:
  CR8-1A PS (Part No. 8-960-098-45) and
  CR8-1B PS (Part No. 8-960-096-86)
- Composite video monitor

  Note

  This monitor is for menu displaying. Be sure to connect it to VIDEO OUTPUT COMPOSITE 3 (SUPER) connector.

Adjustment Items

For the VTR equipped with BKNW-105 (optional kit), the adjustments in Sections 3-6-3 to 3-6-5 and 3-6-8 are not needed.

Section	Adjustment item		Adjustment point	Measurement point
3-6-3	Analog audio outputs (CH1/2/3/4) adjustment (APR-13 board)			
	Output level adj.	CH1	⊘RV300/APR-13	AUDIO OUTPUT CH1
		CH2	⊘RV400/APR-13	AUDIO OUTPUT CH2
		CH3	⊘RV500/APR-13	AUDIO OUTPUT CH3
		CH4	⊘RV600/APR-13	AUDIO OUTPUT CH4
3-6-4	Analog audio offsets (CH3/4) adjustment (APR-13 board)			
	Offset level adj.	CH3	⊘RV103/APR-13	TP700/APR-13
		CH4	⊘RV203/APR-13	TP700/APR-13
3-6-5	Analog audio inputs (CH3/4) adjustment (APR-13 board)			
	1. Input level adj.	CH3	⊘RV100/APR-13, ⊘RV101/APR-13	AUDIO OUTPUT CH3
		CH4	⊘RV200/APR-13, ⊘RV201/APR-13	AUDIO OUTPUT CH4
	2. Distortion rate adj.	CH4	⊘RV202/APR-13	AUDIO OUTPUT CH4
		CH3	⊘RV102/APR-13	AUDIO OUTPUT CH3

Continue

Continued

Section	Item (Section title)		Adjustment point	Measurement point
3-6-6	Analog audio outputs (Monitor L/R) adjustment (APR-12 board)			
	Output level adj.	L	⊘RV300/APR-12	MONITOR OUTPUT L
		R	⊘RV400/APR-12	MONITOR OUTPUT R
3-6-7	Analog audio offsets (CH1/2) adjustment (APR-12 board)			
	Offset level adj.	CH1	⊘RV103/APR-12	TP700/APR-12
		CH2	⊘RV203/APR-12	TP700/APR-12
3-6-8	Analog audio inputs (CH1/2) adjustment (APR-12 board)			
	1. Input level adj.	CH1	⊘RV100/APR-12, ⊘RV101/APR-12	AUDIO OUTPUT CH1
		CH2	⊘RV200/APR-12, ⊘RV201/APR-12	AUDIO OUTPUT CH2
	2. Distortion rate adj.	CH2	⊘RV202/APR-12	AUDIO OUTPUT CH2
		CH1	⊘RV102/APR-12	AUDIO OUTPUT CH1
3-6-9	LAU PB system adjustment (APR-12 board)			
	1. LAU Dalby level rough adj.	CH1	⊘RV503/APR-12	TP501/APR-12
		CH2	⊘RV604/APR-12	TP601/APR-12
	2. LAU PB level rough adj.	CH2	⊘RV605/APR-12	AUDIO OUTPUT CH2 (MONITOR OUTPUT R)
		CH1	⊘RV504/APR-12	AUDIO OUTPUT CH1 (MONITOR OUTPUT L)
	3. LAU PB freq. response adj.	CH1 (OXIDE)	⊘RV501/APR-12, ⊘RV500/APR-12 (S500/APR-12)	AUDIO OUTPUT CH (MONITOR OUTPUT L)
		CH2 (OXIDE)	⊘RV601/APR-12, ⊘RV600/APR-12 (S600/APR-12)	AUDIO OUTPUT CH2 (MONITOR OUTPUT R)
		CH2 (METAL)	⊘RV602/APR-12 for DNW-A100P/A50P/A45P only	AUDIO OUTPUT CH2 (MONITOR OUTPUT R)
		CH1 (METAL)	⊘RV502/APR-12 for DNW-A100P/A50P/A45P only	AUDIO OUTPUT CH1 (MONITOR OUTPUT L)
	4. LAU Dolby level adj.	CH1	⊘RV503/APR-12	TP501/APR-12
		CH2	⊘RV604/APR-12	TP601/APR-12
	5. LAU PB level adj.	CH2	⊘RV605APR-12	AUDIO OUTPUT CH2 (MONITOR OUTPUT R)
		CH1	⊘RV504/APR-12	AUDIO OUTPUT CH1 (MONITOR OUTPUT L)
	6. LAU PB phase adj.		⊘RV603/APR-12	AUDIO OUTPUT CH1/CH2 (MONITOR OUTPUT L/R)

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Note

When performing a partial adjustment after repairing, etc., perform the adjustments (checks) referring to the following table.

Check line	Output line adj.	Offset level adj.	Input line adj.	LAU PB system adj.
CH1/CH2 line	Section 3-6-3 (CH1/2 only)	⇨ Section 3-6-7	⇨ Section 3-6-8	
CH3/CH4 line	Section 3-6-3 (CH3/4 only)	⇨ Section 3-6-4	⇨ Section 3-6-5	
LAU PB line (without BKNW-105)	Section 3-6-3 (Check CH1/2)	⇨ Section 3-6-7 (Check)	⇨ Skip	⇨ Section 3-6-9
LAU PB line (with BKNW-105)	Section 3-6-6 (Check)	⇨ Section 3-6-7 (Check)	⇨ Skip	⇨ Section 3-6-9
Monitor line	Section 3-6-6			

Note

When the analog audio CH1/2/3/4 inputs/outputs are restored after removing BKNW-105 (optional kit), perform the adjustments (checks) for CH1/CH2 and CH3/CH4 lines.

3-6-2. Common Preparation

Perform the settings (shorting plugs, control panels, etc.) toward the VTR before starting the adjustments. Return they settings to the customer settings after completing the audio system alignment.

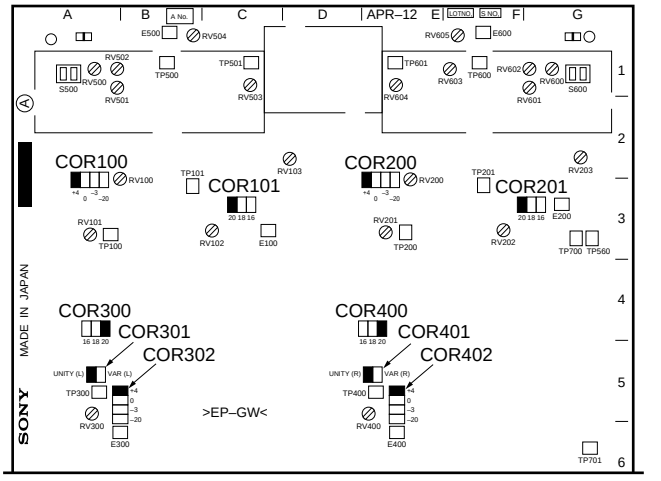
Shorting plugs setting

Reset the shorting plugs of APR-12 board and APR-13 board to the factory settings.

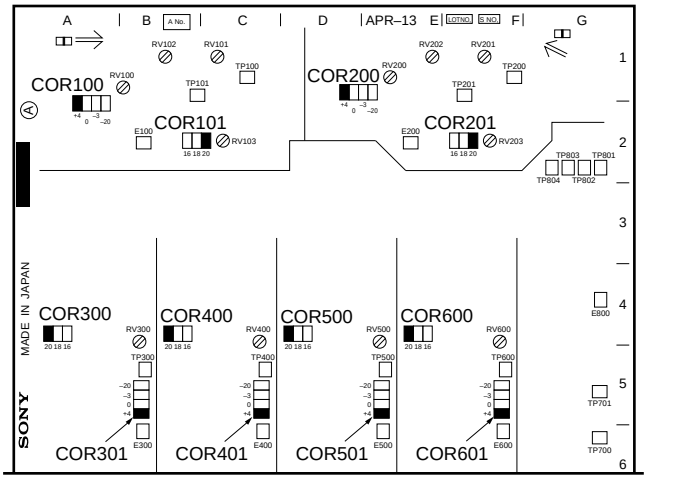
Note

Turn off the power before removing the APR-12/13 board and changing the shorting plugs setting.

Board	Ref. No. (Address)	Item	Customer setting	Factory setting
APR-12	COR100 (A-3)	Analog audio CH1 input level	_____	⇨ +4
	COR101 (C-3)	Analog audio CH1 input headroom	_____	⇨ 20
	COR200 (E-3)	Analog audio CH2 input level	_____	⇨ +4
	COR201 (G-3)	Analog audio CH2 input headroom	_____	⇨ 20
	COR300 (A-4)	Monitor L output headroom	_____	⇨ 20
	COR301 (A-5)	Monitor L output level, fixed or variable	_____	⇨ UNITY(L)
	COR302 (A-5)	Monitor L output level	_____	⇨ +4
	COR400 (E-4)	Monitor R output headroom	_____	⇨ 20
	COR401 (E-5)	Monitor R output level, fixed or variable	_____	⇨ UNITY(R)
	COR402 (E-5)	Monitor R output level	_____	⇨ +4
APR-13	COR100 (A-2)	Analog audio CH3 input level	_____	⇨ +4
	COR101 (B-2)	Analog audio CH3 input headroom	_____	⇨ 20
	COR200 (D-1)	Analog audio CH4 input level	_____	⇨ +4
	COR201 (F-2)	Analog audio CH4 input headroom	_____	⇨ 20
	COR300 (A-4)	Analog audio CH1 output headroom	_____	⇨ 20
	COR301 (B-5)	Analog audio CH1 output level	_____	⇨ +4
	COR400 (B-4)	Analog audio CH2 output headroom	_____	⇨ 20
	COR401 (C-5)	Analog audio CH2 output level	_____	⇨ +4
	COR500 (D-4)	Analog audio CH3 output headroom	_____	⇨ 20
	COR501 (E-5)	Analog audio CH3 output level	_____	⇨ +4
	COR600 (E-4)	Analog audio CH4 output headroom	_____	⇨ 20
	COR601 (F-5)	Analog audio CH4 output level	_____	⇨ +4



APR-12 Board (Side A)



APR-13 Board (Side A)

http://getMANUAL.com

Others settings

Location	Item		Customer setting	Setting at adjustment
SS-63 board	DIP switch S1100 (J-1)	No. 1	_____	⇨ ON (Set to the up position)
	Note Set to ON to treat the extended menu of the setup menu.			
Upper control panel	PB (audio level) controls	CH1	_____	⇨ PRESET
		CH2	_____	⇨ PRESET
		CH3	_____	⇨ PRESET
		CH4	_____	⇨ PRESET
	REC (audio level) controls	CH1	_____	⇨ PRESET
		CH2	_____	⇨ PRESET
		CH3	_____	⇨ PRESET
		CH4	_____	⇨ PRESET
	AUDIO INPUT SELECT		_____	⇨ ANALOG/AES/EBU
	MONITOR SELECT	L	_____	⇨ CH1
		R	_____	⇨ CH2
	REMOTE/LOCAL selection		_____	⇨ LOCAL (9P: unlit)
Sub control panel	EMPHASIS switch		_____	⇨ OFF
	CHARACTER switch		_____	⇨ ON
	DOLBY NR switch		_____	⇨ OFF
	KEY INHIBIT switch		_____	⇨ OFF
Connector panel (only without BKNW-105)				
	AUDIO INPUT CH1 LEVEL switch		_____	⇨ HIGH/ON 600Ω (Set to the right position.)
	AUDIO INPUT CH2 LEVEL switch		_____	⇨ HIGH/ON 600Ω (Set to the right position.)
	AUDIO INPUT CH3 LEVEL switch		_____	⇨ HIGH/ON 600Ω (Set to the right position.)
	AUDIO INPUT CH4 LEVEL switch		_____	⇨ HIGH/ON 600Ω (Set to the right position.)

Operation system check

Be sure to adjust in the following system.
DNW-A100/A50/A45: 525/60 system
DNW-A100P/A50P/A45P: 625/50 system

If differed, change the operation system using the setup menu ITEM-013 before adjusting.
(For the ITEM-013, refer to Section 7-2-2 of the operation manual.)

3-6-3. Analog Audio Outputs (CH1/2/3/4) Adjustment (APR-13 Board)

Note

For the VTR equipped with BKNW-105 (optional kit), Section 3-6-3 is not needed.

Preparing tools

- Audio analyzer:
  TEKTRONIX AA501A-option 02 or equivalent
- Extension board: EX-556 (Part No. A-8277-212-A)
- Analog composite video monitor

  Note

  This monitor is for menu displaying. Be sure to connect it to VIDEO OUTPUT COMPOSITE 3 (SUPER) connector.

Preparation

1. Check that the shorting plug settings on the APR-13 board are the factory settings.

(Refer to "Shorting plugs setting" in Section 3-6-2.)

2. Extend the APR-13 board with an extension board EX-556.

Note

Wait more than 30 seconds after turning off the power, then remove the APR-13 board.

3. Check the settings on the upper control panel.

PB (audio level) controls: All CHs ⇨ PRESET

4. Check the setting on the sub control panel.

CHARACTER switch ⇨ ON

5. Check that the equipment has warmed up.

Before starting the adjustment, warm up the VTR and audio analyzer through the power for 20 minutes or more.

Output Level Adjustment

1. To enter the maintenance mode, press S1101(G-1) on the SS-63 board.
2. In C23 : AUDIO TEST SG of the maintenance mode, select "1KHz SINE 0VU" as test signal.
3. Set the audio analyzer as follows:
   Function mode: LEVEL, dBm (600 Ω)
   Input filter: 80 kHz LPF

CH1 adjustment

4. Connect the audio analyzer's input to AUDIO OUTPUT CH1 connector.
5. Adjust the audio level on the audio analyzer.
   Adj. point: ⊘RV300/APR-13(B-4)
   Specification: +4.0 ±0.1 dBm (at 600 Ω load)

CH2 adjustment

6. Connect the audio analyzer's input to AUDIO OUTPUT CH2 connector.
7. Adjust the audio level on the audio analyzer.
   Adj. point: ⊘RV400/APR-13(C-4)
   Specification: +4.0 ±0.1 dBm (at 600 Ω load)

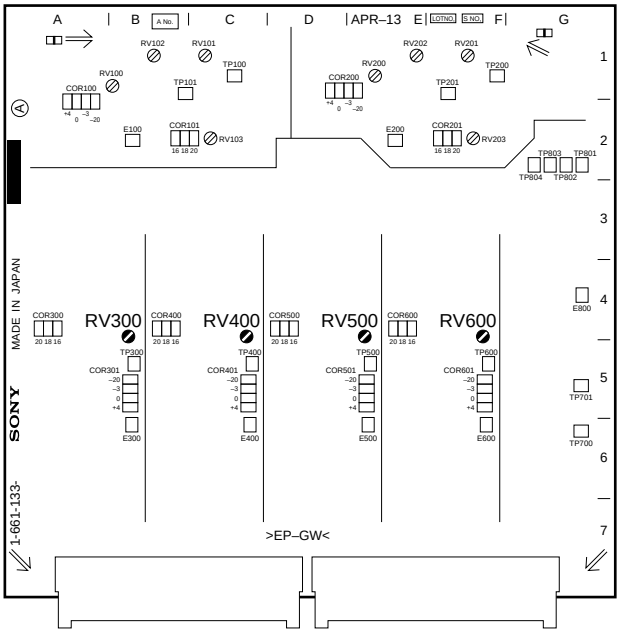
CH3 adjustment

8. Connect the audio analyzer's input to AUDIO OUTPUT CH3 connector.
9. Adjust the audio level on the audio analyzer.
   Adj. point: ⊘RV500/APR-13(E-4)
   Specification: +4.0 ±0.1 dBm (at 600 Ω load)

CH4 adjustment

10. Connect the audio analyzer's input to AUDIO OUTPUT CH4 connector.
11. Adjust the audio level on the audio analyzer.
    Adj. point: ⊘RV600/APR-13(F-4)
    Specification: +4.0 ±0.1 dBm (at 600 Ω load)

12. To exist the maintenance mode, press the MENU button four times.



APR-13 Board (Side A)

3-6-4. Analog Audio Offsets (CH3/4) Adjustment (APR-13 Board)

Note

For the VTR equipped with BKNW-105 (optional kit), Section 3-6-4 is not needed.

Preparing tools

- Oscilloscope: TEKTRONIX 2465B or equivalent
- Extension board: EX-556 (Part No. A-8277-212-A)
- Shorting clip

Preparation

1. Check that the shorting plug settings on the APR-13 board are the factory settings.

(Refer to "Shorting plugs setting" in Section 3-6-2.)

2. Extend the APR-13 board with an extension board EX-556.

Note

Wait more than 30 seconds after turning off the power, then remove the APR-13 board.

3. Check the settings on the upper control panel.

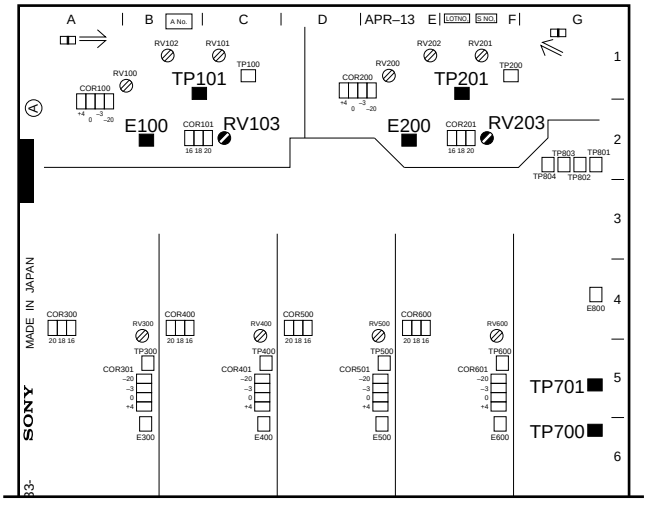
PB (audio level) controls: CH3 ⇨ PRESET
CH4 ⇨ PRESET

4. Check the setting on the sub control panel.

EMPHASIS switch ⇨ OFF

5. Check that the equipment has warmed up.

Before starting the adjustment, warm up the VTR and oscilloscope through the power for 20 minutes or more.



APR-13 Board (Side A)

Offset Level Adjustment

1. Set and connect the oscilloscope as follows:
   Band width limit: ON
   CH-1: TP700/APR-13(G-6), DC 5 V/DIV
   CH-2: TP701/APR-13(G-5), DC 5 V/DIV
   TIME: 2 µs/DIV
   TRIG: CH-2, − slope

CH3 adjustment

2. Short-circuit TP101(B-1) and E100(B-2) on the APR-13 board with a shorting clip.
3. Adjust so that audio CH3 part of the waveform at TP700 makes the same waveform to the Figure 1 (left side).
   Adj. point: ⊘RV103/APR-13(C-2)
4. Remove the shorting clip on the APR-13 board.

CH4 adjustment

5. Short-circuit TP201(F-1) and E200(E-2) on the APR-13 board with a shorting clip.
6. Change the oscilloscope's trigger to the + slope.
7. Adjust so that audio CH4 part of the waveform at TP700 makes the same waveform to the Figure 1 (right side).
   Adj. point: ⊘RV203/APR-13(F-2)
8. Remove the shorting clip on the APR-13 board.

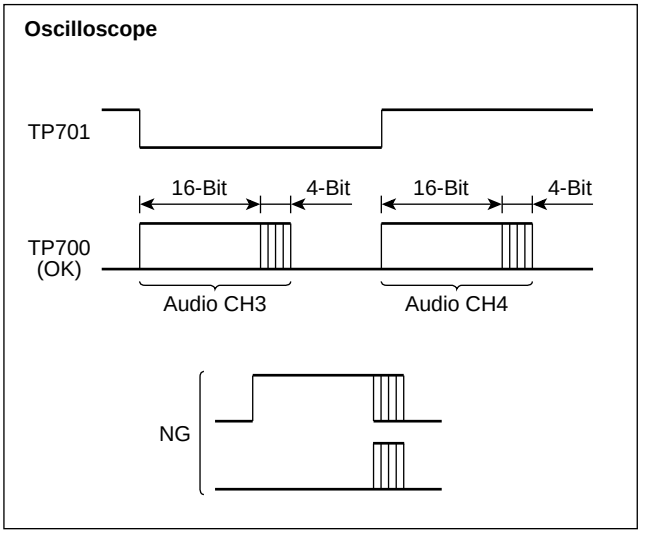


Figure 1. Waveform of CH3/CH4 Offset Level Adjustment

3-6-5. Analog Audio Inputs (CH3/4) Adjustment (APR-13 Board)

Note

When the VTR equipped with BKNW-105 (optional kit), Section 3-6-5 is not needed.

Preparing tools

- Audio signal generator:
  TEKTRONIX SG505-option 02 or equivalent
- Audio analyzer:
  TEKTRONIX AA501A-option 02 or equivalent
- Extension board: EX-556 (Part No. A-8277-212-A)
- Shorting clip

Preparation

1. Check that the shorting plug settings on the APR-13 board are the factory settings.

(Refer to "Shorting plugs setting" in Section 3-6-2.)

2. Extend the APR-13 board with an extension board EX-556.

Note

Wait more than 30 seconds after turning off the power, then remove the APR-13 board.

3. Check the settings on the upper control panel.

PB (audio level) controls: CH3 ⇨ PRESET
CH4 ⇨ PRESET
REC (audio level) controls: CH3 ⇨ PRESET
CH4 ⇨ PRESET
AUDIO INPUT SELECT ⇨ ANALOG/AES/EBU

4. Check the setting on the sub control panel.

EMPHASIS switch ⇨ OFF

5. Check the settings on the connector panel.

AUDIO INPUT LEVEL switches:
CH3 ⇨ HIGH/ON 600Ω (right position)
CH4 ⇨ HIGH/ON 600Ω (right position)

6. Check that the equipment has warmed up.

Before starting the adjustment, warm up the VTR and other equipment through the power for 20 minutes or more.

1. Input Level Adjustment

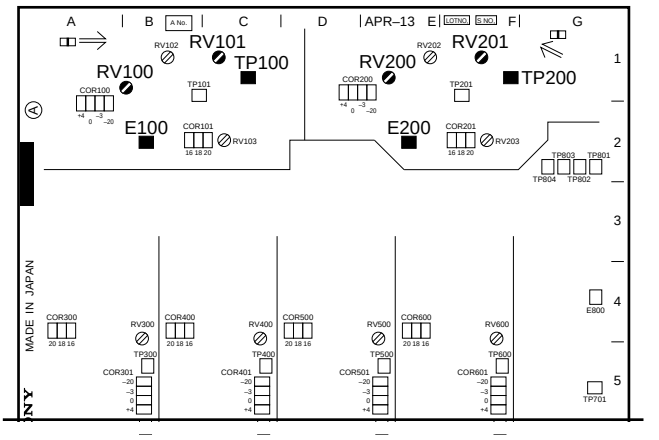
1. Set the audio analyzer as follows:
   Function mode: LEVEL, dBm (600 Ω)
   Input filter: 80 kHz LPF

CH3 adjustment

2. Short-circuit TP100(B-1) and E100(B-2) on the APR-13 board with a shorting clip.
3. Input the audio signal (1 kHz, +4.0 dBm) to AUDIO INPUT CH3 connector.
4. Connect the audio analyzer's input to AUDIO OUTPUT CH3 connector.
5. Adjust the audio level on the audio analyzer.
   Adj. point: ◓RV100/APR-13(B-1)
   Specification: +4.0 ±0.1 dBm (at 600 Ω load)
6. Remove the shorting clip on the APR-13 board.
7. Adjust the audio level on the audio analyzer.
   Adj. point: ◓RV101/APR-13(C-1)
   Specification: +4.0 ±0.1 dBm (at 600 Ω load)

CH4 adjustment

8. Short-circuit TP200(F-1) and E200(E-2) on the APR-13 board with a shorting clip.
9. Input the audio signal (1 kHz, +4.0 dBm) to AUDIO INPUT CH4 connector.
10. Connect the audio analyzer's input to AUDIO OUTPUT CH4 connector.
11. Adjust the audio level on the audio analyzer.
    Adj. point: ◓RV200/APR-13(E-1)
    Specification: +4.0 ±0.1 dBm (at 600 Ω load)
12. Remove the shorting clip on the APR-13 board.
13. Adjust the audio level on the audio analyzer.
    Adj. point: ◓RV201/APR-13(F-1)
    Specification: +4.0 ±0.1 dBm (at 600 Ω load)



APR-13 Board (Side A)

2. Distortion Rate Adjustment

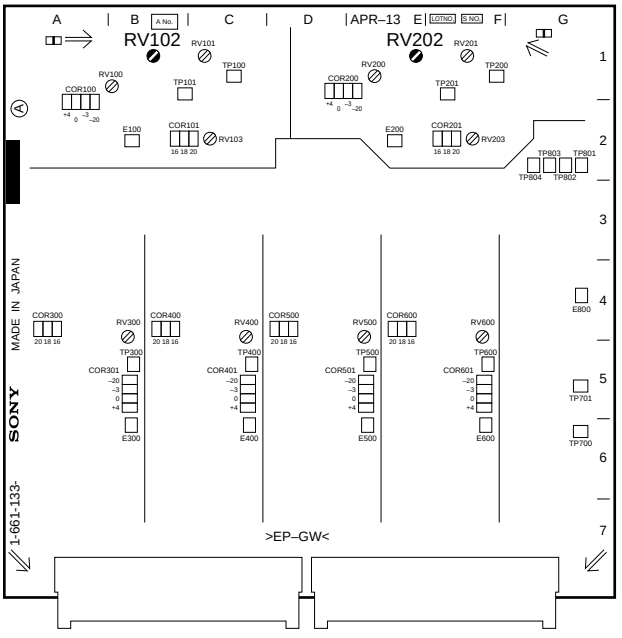
1. Set the audio analyzer as follows:
   Function mode: THD+N
   Range: 2%
   Input filter: 80 kHz LPF

CH4 adjustment

2. Input the audio signal (1 kHz, +23.5 dBm) to AUDIO INPUT CH4 connector.
3. Connect the audio analyzer's input to AUDIO OUTPUT CH4 connector.
4. Adjust the distortion rate on the audio analyzer.
   Adj. point: ◓RV202/APR-13(E-1)
   Specification: Minimize (0.10% or less: OK)

CH3 adjustment

5. Input the audio signal (1 kHz, +23.5 dBm) to AUDIO INPUT CH3 connector.
6. Connect the audio analyzer's input to AUDIO OUTPUT CH3 connector.
7. Adjust the distortion rate on the audio analyzer.
   Adj. point: ◓RV102/APR-13(B-1)
   Specification: Minimize (0.10% or less: OK)



APR-13 Board (Side A)

3-6-6. Analog Audio Monitor Outputs (L/R) Adjustment (APR-12 Board)

Preparing tools

- Audio analyzer:
  TEKTRONIX AA501A-option 02 or equivalent
- Extension board: EX-556 (Part No. A-8277-212-A)
- Analog composite video monitor

Note

This monitor is for menu displaying. Be sure to connect it to VIDEO OUTPUT COMPOSITE 3 (SUPER) connector.

Preparation

1. Check that the shorting plug settings on the APR-12 board are the factory settings.

(Refer to "Shorting plugs setting" in Section 3-6-2.)

2. Extend the APR-12 board with an extension board EX-556.

Note

Wait more than 30 seconds after turning off the power, then remove the APR-12 board.

3. Check the settings on the upper control panel.

PB (audio level) controls: All CHs ⇨ PRESET

4. Check the setting on the sub control panel.

CHARACTER switch ⇨ ON

5. Check that the equipment has warmed up.

Before starting the adjustment, warm up the VTR and audio analyzer through the power for 20 minutes or more.

Output Level Adjustment

1. To enter the maintenance mode, press S1101(G-1) on the SS-63 board.
2. In C23 : AUDIO TEST SG of the maintenance mode, select “1KHz SINE 0VU” as test signal.
3. Set the audio analyzer as follows:
   Function mode: LEVEL, dBm (600 Ω)
   Input filter: 80 kHz LPF

L channel adjustment

4. Connect the audio analyzer’s input to MONITOR OUTPUT L connector.
5. Adjust the audio level on the audio analyzer.
   Adj. point: ⊘RV300/APR-12(A-5)
   Specification: +4.0 ±0.1 dBm (at 600 Ω load)

R channel adjustment

6. Connect the audio analyzer’s input to MONITOR OUTPUT R connector.
7. Adjust the audio level on the audio analyzer.
   Adj. point: ⊘RV400/APR-12(E-5)
   Specification: +4.0 ±0.1 dBm (at 600 Ω load)

8. To exit the maintenance mode, press the MENU button once.

3-6-7. Analog Audio Offsets (CH1/2) Adjustment (APR-12 Board)

Preparing tools

- Oscilloscope: TEKTRONIX 2465B or equivalent
- Extension board: EX-556 (Part No. A-8277-212-A)
- Shorting clip

Preparation

1. Check that the shorting plug settings on the APR-12 board are factory settings.

(Refer to “Shorting plugs setting” in Section 3-6-2.)

2. Extend the APR-12 board with an extension board EX-556.

Note

Wait more than 30 seconds after turning off the power, then remove the APR-12 board.

3. Check the settings on the upper control panel.

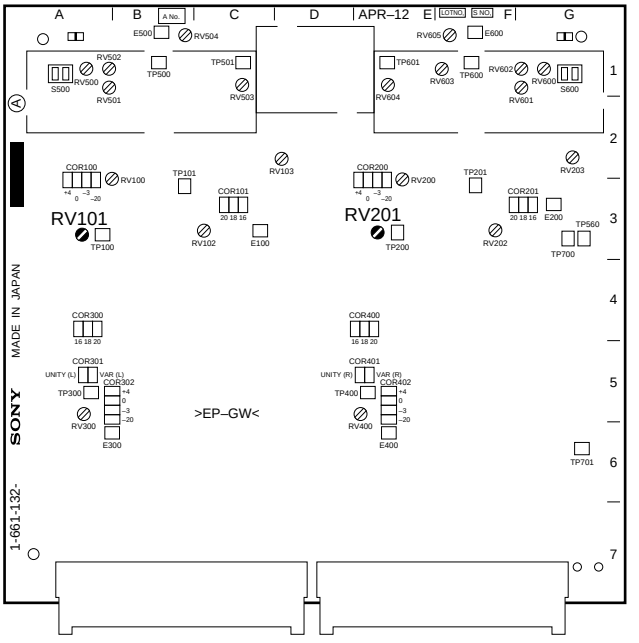
PB (audio level) controls: CH1 ⇨ PRESET
CH2 ⇨ PRESET

4. Check the setting on the sub control panel.

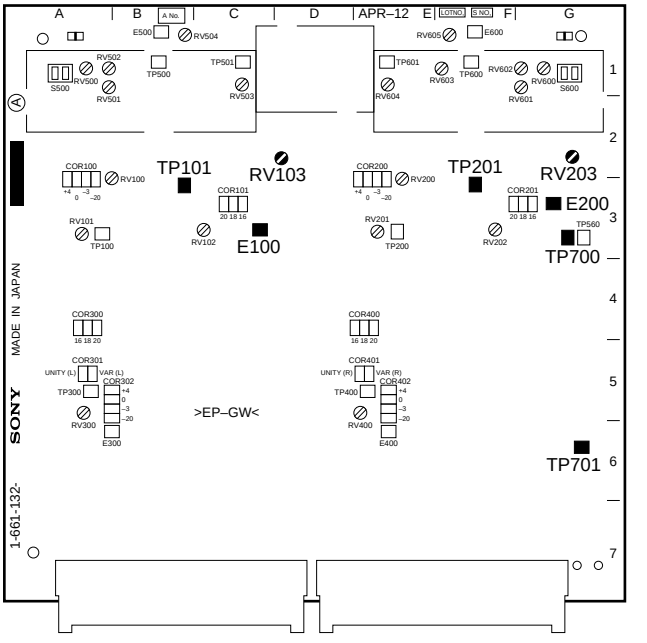
EMPHASIS switch ⇨ OFF

5. Check that the equipment has warmed up.

Before starting the adjustment, warm up the VTR and oscilloscope through the power for 20 minutes or more.



APR-12 Board (Side A)



APR-12 Board (Side A)

Offset Level Adjustment

CH1 adjustment

1. Short-circuit TP101(B-3) and E100(C-3) on the APR-12 board with a shorting clip.
2. Set and connect the oscilloscope as follows:
   Band width limit: ON
   CH-1: TP700/APR-12(G-3), DC 5 V/DIV
   CH-2: TP701/APR-12(G-6), DC 5 V/DIV
   TIME: 2 µs/DIV
   TRIG: CH-2, − slope
3. Adjust so that audio CH1 part of the waveform at TP700 makes the same waveform to the Figure 2 (left side).
   Adj. point: ⊘RV103/APR-12(D-2)
4. Remove the shorting clip on the APR-12 board.

CH2 adjustment

5. Short-circuit TP201(F-3) and E200(G-3) on the APR-12 board with a shorting clip.
6. Set the oscilloscope's trigger to the + slope.
7. Adjust so that audio CH2 part of the waveform at TP700 makes the same waveform to the Figure 2 (right side).
   Adj. point: ⊘RV203/APR-12(G-2)
8. Remove the shorting clip on the APR-12 board.

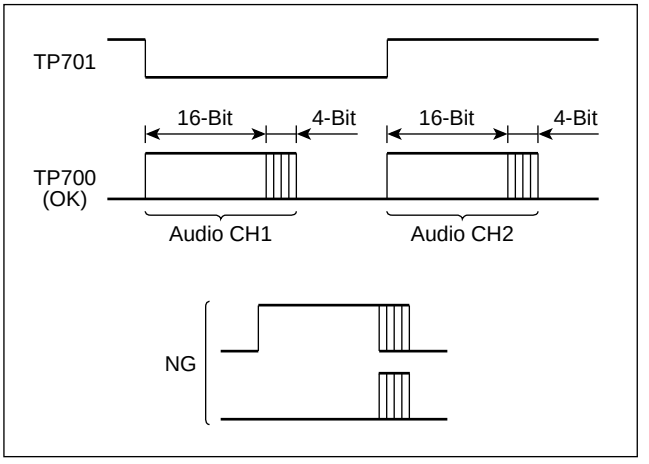


Figure 2. Waveform of CH1/CH2 Offset Level Adjustment

3-6-8. Analog Audio Inputs (CH1/2) Adjustment (APR-12 Board)

Note

For the VTR equipped with BKNW-105 (optional kit), Section 3-6-8 is not needed.

Preparing tools

- Audio signal generator:
  TEKTRONIX SG505-option 02 or equivalent
- Audio analyzer:
  TEKTRONIX AA501A-option 02 or equivalent
- Extension board: EX-556 (Part No. A-8277-212-A)
- Shorting clip

Preparation

1. Check that the shorting plug settings on the APR-12/13 boards are the factory settings.

(Refer to "Shorting plugs setting" in Section 3-6-2.)

2. Extend the APR-12 board with an extension board EX-556.

Note

Wait more than 30 seconds after turning off the power, then remove the APR-12 board.

3. Check the settings on the upper control panel.

PB (audio level) controls: CH1 ⇨ PRESET
CH2 ⇨ PRESET
REC (audio level) controls: CH1 ⇨ PRESET
CH2 ⇨ PRESET
AUDIO INPUT SELECT ⇨ ANALOG/AES/EBU

4. Check the setting on the sub control panel.

EMPHASIS switch ⇨ OFF

5. Check the settings on the connector panel.

AUDIO INPUT LEVEL switches:
CH1 ⇨ HIGH/ON 600Ω (right position)
CH2 ⇨ HIGH/ON 600Ω (right position)

6. Check that the equipment has warmed up.

Before starting the adjustment, warm up the VTR and other equipment through the power for 20 minutes or more.

1. Input Level Adjustment

1. Set the audio analyzer as follows:
   Function mode: LEVEL, dBm (600 Ω)
   Input filter: 80 kHz LPF

CH1 adjustment

2. Short-circuit TP100 (A-3) and E100 (C-3) on the APR-12 board with the shorting clip.
3. Input the audio signal (1 kHz, +4.0 dBm) to AUDIO INPUT CH1 connector.
4. Connect the audio analyzer's input to AUDIO OUTPUT CH1 connector.
5. Adjust the audio level on the audio analyzer.
   Adj. point: ⊘RV100/APR-12(A-3)
   Specification: +4.0 ±0.1 dBm (at 600 Ω load)
6. Remove the shorting clip on the APR-12 board.
7. Adjust the audio level on the audio analyzer.
   Adj. point: ⊘RV101/APR-12(A-3)
   Specification: +4.0 ±0.1 dBm (at 600 Ω load)

CH2 adjustment

8. Short-circuit TP200(E-3) and E200(G-3) on the APR-12 board with a shorting clip.
9. Input the audio signal (1 kHz, +4.0 dBm) to AUDIO INPUT CH2 connector.
10. Connect the audio analyzer's input to AUDIO OUTPUT CH2 connector.
11. Adjust the audio level on the audio analyzer.
    Adj. point: ⊘RV200/APR-12(E-3)
    Specification: +4.0 ±0.1 dBm (at 600 Ω load)
12. Remove the shorting clip on the APR-12 board.
13. Adjust the audio level on the audio analyzer.
    Adj. point: ⊘RV201/APR-12(E-3)
    Specification: +4.0 ±0.1 dBm (at 600 Ω load)

2. Distortion Rate Adjustment

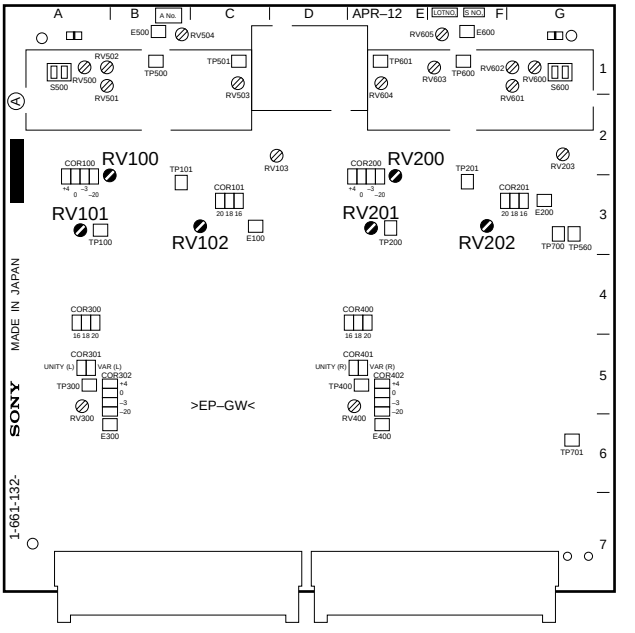
1. Set the audio analyzer as follows:
   Function mode: THD+N
   Range: 2%
   Input filter: 80 kHz LPF

CH2 adjustment

2. Input the audio signal (1 kHz, +23.5 dBm) to AUDIO INPUT CH2 connector.
3. Connect the audio analyzer's input to AUDIO OUTPUT CH2 connector.
4. Adjust the distortion rate on the audio analyzer.
   Adj. point: ⊘RV202/APR-12(F-3)
   Specification: Minimize (0.10% or less: OK)

CH1 adjustment

5. Input the audio signal (1 kHz, +23.5 dBm) to AUDIO INPUT CH1 connector.
6. Connect the audio analyzer's input to AUDIO OUTPUT CH2 connector.
7. Adjust the distortion rate on the audio analyzer.
   Adj. point: ⊘RV102/APR-12(C-3)
   Specification: Minimize (0.10% or less: OK)



APR-12 Board (Side A)

3-6-9. LAU PB System Adjustment (APR-12 Board)

Preparing tools

- Audio analyzer:
  TEKTRONIX AA501A-option 02 or equivalent
- Audio level meter:
  HEWLETT-PACKARD HP3400A or equivalent
- Oscilloscope: TEKTRONIX 2465B or equivalent
- Extension board: EX-556 (Part No. A-8277-212-A)
- Alignment tape for DNW-A100/A50/A45:
  CR8-1A (Part No. 8-960-097-45)
- Alignment tapes for DNW-A100P/A50P/A45P:
  CR8-1A PS (Part No. 8-960-098-45) and
  CR8-1B PS (Part No. 8-960-096-86)
- Analog composite video monitor

Note

This monitor is for menu displaying. Be sure to connect it to VIDEO OUTPUT COMPOSITE 3 (SUPER) connector.

Preparation

1. Check that the shorting plug settings on the APR-12/13 boards are the factory settings.

(Refer to “Shorting plugs setting” in Section 3-6-2.)

2. Extend the APR-12 board with an extension board EX-556.

Note

Wait more than 30 seconds after turning off the power, then remove the APR-12 board.

3. Clean the AT head.

Clean the tape running surface of the AT head. (Refer to “5-2-5. Stationary Heads Cleaning” of the maintenance manual part 1.)

Note

Perform the cleaning under the power off.

4. Check the settings on the upper control panel.

PB (audio level) controls: CH1 ⇨ PRESET
CH2 ⇨ PRESET
MONITOR SELECT: L ⇨ CH1
R ⇨ CH2
REMOTE/LOCAL selection ⇨ LOCAL (9P: unlit)

5. Check the settings on the sub control panel.

EMPHASIS switch ⇨ OFF
DOLBY NR switch ⇨ OFF
KEY INHIBIT switch ⇨ OFF

6. Check the operation system.

Check that the operation system is setting as follows:
DNW-A100/A50/A45: 525/60 system
DNW-A100P/A50P/A45P: 625/50 system.
If differed, change the operation system in the setup menu ITEM-013 before adjusting. (For the ITEM-013, refer to Section 7-2-2 of the operation manual.)

7. Check that the equipment has warmed up.

Before starting the adjustment, warm up the VTR and equipment through the power for 20 minutes or more.

8. Set the setup extend menu ITEM-F01 to “SW”. (For the DNW-A100P/A50P/A45P only)

Notes

- To display the ITEM-F00 series, turn the search dial with the PLAY button pressing.
- Return the ITEM-F01 : AUDIO NR IN SP MODE to “ON” after the LAU PB system adjustment are completed.

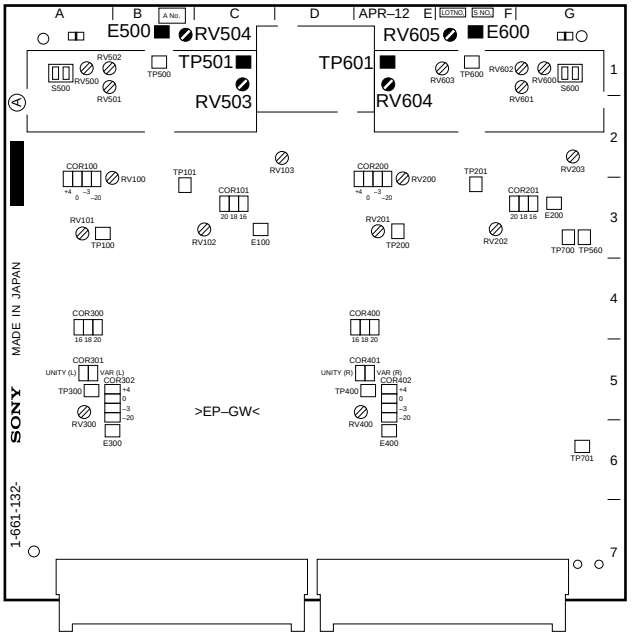
1. LAU Dolby Level Rough Adjustment

CH1 adjustment

1. Connect the audio level meter to TP501(C-1) on the APR-12 board. GND: E500/APR-12(B-1)
2. Play back the 1 kHz, 0 VU portion (0:00 to 2:55) of the following alignment tape in PLAY mode.
   For DNW-A100/A50/A45: CR8-1A
   For DNW-A100P/A50P/A45P: CR8-1B PS
3. Adjust the audio level on the audio level meter.
   Adj. point: ⊘RV503/APR-12(C-1)
   Specification: −10.0 ±0.5 dBu (0 dBu ≒ 0.775 V rms)

CH2 adjustment

4. Connect the audio level meter to TP601(E-1) on the APR-12 board. GND: E600/APR-12(F-1)
5. Play back the 1 kHz, 0 VU portion (0:00 to 2:55) of the alignment tape CR8-1A / CR8-1B PS in PLAY mode.
6. Adjust the audio level on the audio level meter.
   Adj. point: ⊘RV604/APR-12(E-1)
   Specification: −10.0 ±0.5 dBu (0 dBu ≒ 0.775 V rms)



APR-12 Board (Side A)

2. LAU PB Level Rough Adjustment

1. Set the audio analyzer as follows:
   Function mode: LEVEL, dBm (600 Ω)
   Input filter: 80 kHz LPF

CH2 adjustment

2. Connect the audio analyzer's input to AUDIO OUTPUT CH2 connector.
   When the VTR is equipped with BKNW-105 (optional kit), connect the audio analyzer to MONITOR OUTPUT R connector.
3. Play back the 1 kHz, 0 VU portion (0:00 to 2:55) of the following alignment tape in PLAY mode.
   For DNW-A100/A50/A45: CR8-1A
   For DNW-A100P/A50P/A45P: CR8-1B PS
4. Adjust the audio level on the audio analyzer.
   Adj. point: ⊘RV605/APR-12(F-1)
   Specification: +4.0 ±0.5 dBm (at 600 Ω load)

CH1 adjustment

5. Connect the audio analyzer's input to AUDIO OUTPUT CH1 connector.
   When the VTR is equipped the BKNW-105, connect it to MONITOR OUTPUT L connector
6. Play back the 1 kHz, 0 VU portion (0:00 to 2:55) of the CR8-1A or CR8-1B PS in PLAY mode.
7. Adjust the audio level on the audio analyzer.
   Adj. point: ⊘RV504/APR-12(B-1)
   Specification: +4.0 ±0.5 dBm (at 600 Ω load)

3. LAU PB Frequency Response Adjustment

Note

In the DNW-A100/A50/A45 are not performed the adjustments using the metal particle tape.

1. Set the audio analyzer as follows:
   Function mode: dB RATIO
   Input filter: 80 kHz LPF

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CH1 adjustment (OXIDE)

2. Connect the audio analyzer's input to AUDIO OUTPUT CH1 connector.
   When the VTR is equipped with BKNW-105 (optional kit), connect the audio analyzer to MONITOR OUTPUT L connector.
3. During play back the 1 kHz, −20 VU portion (5:00 to 5:55) of the following alignment tape in PLAY mode, measure the audio level on the audio analyzer.
   For DNW-A100/A50/A45: CR8-1A
   For DNW-A100P/A50P/A45P: CR8-1A PS
   This measured audio level is a reference level (0 dB).
4. During play back the following specified portions (−20 VU) of the CR8-1A / CR8-1A PS in PLAY mode, check or adjust the dB ratio in response to each frequency portion.

   Note

   If the specification for RV500 adjustment is not satisfied, readjust after changing the setting of S500(A-1) on the APR-12 board.

CH2 adjustment (OXIDE)

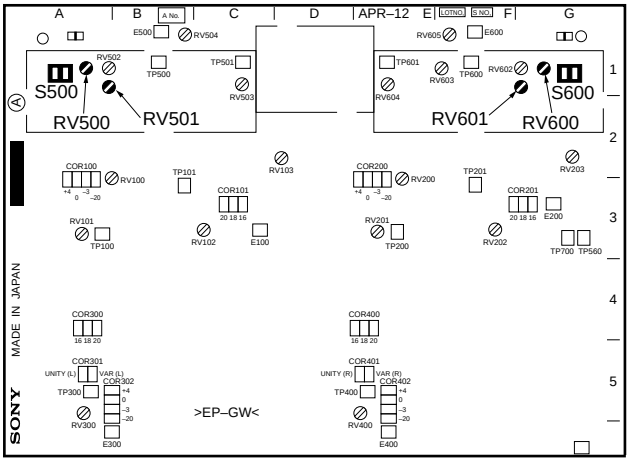
5. Connect the audio analyzer's input to AUDIO OUTPUT CH2 connector.
   When the VTR is equipped with BKNW-105, connect the audio analyzer to MONITOR OUTPUT R connector.
6. During play back the 1 kHz, −20 VU portion (5:00 to 5:55) of the CR8-1A / CR8-1A PS in PLAY mode, measure the audio level on the audio analyzer.
   This measured audio level is a reference level (0 dB).
7. During play back the following specified portions (−20 VU) of the CR8-1A / CR8-1A PS in PLAY mode, check or adjust the dB ratio in response to each frequency portion.

   Note

   If the specification for RV600 adjustment is not satisfied, readjust after changing the setting of S600(G-1) on the APR-12 board.

	Specification [dB]		
Playback portion	**DNW-A100/A50/45**	**DNW-A100P/A50P/45P**	**Adjustment point**
5:00 to 5:55 (1 kHz)	Measured audio level is a reference level (0 dB).		—
6:00 to 6:25 (40 Hz)	C.V. $^{+0.7}_{-1.7}$	C.V. $^{+0.7}_{-1.7}$	(Check only)
6:30 to 6:55 (7 kHz)	C.V. ±0.3	C.V. ±0.4	CH-1: ⊘RV501/APR-12 (A-1) CH-2: ⊘RV601/APR-12 (G-1)
7:00 to 7:25 (10 kHz)	C.V. ±0.3	C.V. ±0.4	(Check only)
7:30 to 7:55 (15 kHz)	C.V. $^{+0.3}_{-1.0}$	C.V. $^{+1.0}_{-1.7}$	CH-1:⊘RV500/APR-12 (A-1) CH-2:⊘RV600/APR-12 (G-1)

The correction values (C.V.) are given on the label of the alignment tape.



APR-12 Board (Side A)

CH1 adjustment (METAL)
for DNW-A100P/A50P/45P only

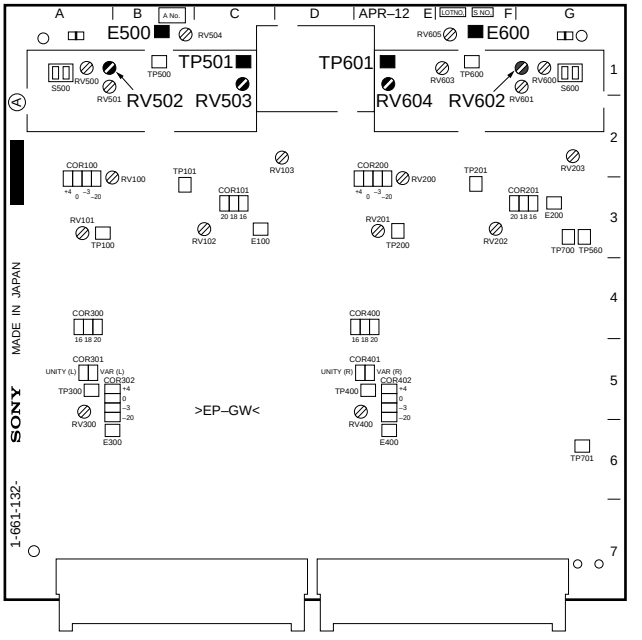
8. Connect the audio analyzer's input to AUDIO OUTPUT CH1 connector.
   When the VTR is equipped with BKNW-105 (optional kit), connect the audio analyzer to MONITOR OUTPUT L connector.
9. During play back the 1 kHz, −20 VU portion (5:00 to 5:55) of the alignment tape CR8-1B PS in PLAY mode, measure the audio level on the audio analyzer.
   This measured audio level is a reference level (0 dB).
10. During play back the following specified portions (−20 VU) of the CR8-1B PS in PLAY mode, check or adjust the dB ratio in response to each frequency portion.

CH2 adjustment (METAL)
for DNW-A100P/A50P/45P only

11. Connect the audio analyzer's input to AUDIO OUTPUT CH2 connector.
    When the VTR is equipped with BKNW-105, connect the audio analyzer to MONITOR OUTPUT R connector.
12. During play back the 1 kHz, −20 VU portion (5:00 to 5:55) of the CR8-1B PS in PLAY mode, measure the audio level on the audio analyzer.
    This measured audio level is a reference level (0 dB).
13. During play back the following specified portions (−20 VU) of the CR8-1B PS in PLAY mode, check or adjust the dB ratio in response to each frequency portion.

Playback portion	Specification [dB]	Adjustment point
5:00 to 5:55 (1 kHz)	Measured audio level is a reference level (0 dB).	—
6:00 to 6:25 (40 Hz)	C.V. $^{+0.7}_{-1.7}$	(Check only)
6:30 to 6:55 (7 kHz)	C.V. ±0.3	(Check only)
7:00 to 7:25 (10 kHz)	C.V. ±0.4	(Check only)
7:30 to 7:55 (15 kHz)	C.V. ±0.5	CH-1: ⊘RV502/APR-12(A-1) CH-2: ⊘RV602/APR-12(G-1)

The correction values (C.V.) are given on the label of the alignment tape.



APR-12 Board (Side A)

4. LAU Dolby Level Adjustment

CH1 adjustment

1. Connect the audio level meter to TP501(C-1) on the APR-12 board. GND: E500/APR-12(B-1)
2. Play back the 1 kHz, 0 VU portion (0:00 to 2:55) of the following alignment tape in PLAY mode.
   For DNW-A100/A50/A45: CR8-1A
   For DNW-A100P/A50P/A45P: CR8-1B PS
3. Adjust the audio level on the audio level meter.
   Adj. point: ⊘RV503/APR-12(C-1)
   Specification: −10.0 ±0.2 dBu (0 dBu ≒ 0.775 V rms)

CH2 adjustment

4. Connect the audio level meter to TP601(E-1) on the APR-12 board. GND: E600/APR-12(F-1)
5. Play back the 1 kHz, 0 VU portion (0:00 to 2:55) of the CR8-1A / CR8-1B PS in PLAY mode.
6. Adjust the audio level on the audio level meter.
   Adj. point: ⊘RV604/APR-12(E-1)
   Specification: −10.0 ±0.2 dBu (0 dBu ≒ 0.775 V rms)

5. LAU PB Level Adjustment

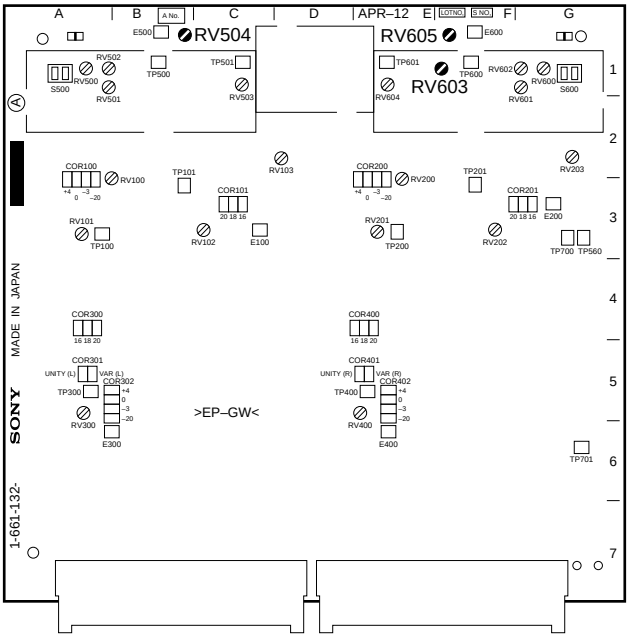
1. Set the audio analyzer as follows:
   Function mode: LEVEL, dBm (600 Ω)
   Input filter: 80 kHz LPF

CH2 adjustment

2. Connect the audio analyzer's input to AUDIO OUTPUT CH2 connector.
   When the VTR is equipped with BKNW-105 (optional kit), connect the audio analyzer to MONITOR OUTPUT R connector.
3. Play back the 1 kHz, 0 VU portion (0:00 to 2:55) of the following alignment tape in PLAY mode.
   For DNW-A100/A50/A45: CR8-1A
   For DNW-A100P/A50P/A45P: CR8-1B PS
4. Adjust the audio level on the audio analyzer.
   Adj. point: ⊘RV605/APR-12(F-1)
   Specification: +4.0 ± 0.2 dBm (at 600 Ω load)

CH1 adjustment

5. Connect the audio analyzer's input to AUDIO OUTPUT CH1 connector.
   When the VTR is equipped the BKNW-105, connect it to MONITOR OUTPUT L connector
6. Play back the 1 kHz, 0 VU portion (0:00 to 2:55) of the CR8-1A or CR8-1B PS in PLAY mode.
7. Adjust the audio level on the audio analyzer.
   Adj. point: ⊘RV504/APR-12(B-1)
   Specification: +4.0 ± 0.2 dBm (at 600 Ω load)



APR-12 Board (Side A)

6. LAU PB Phase Adjustment

1. Connect and set the oscilloscope as follows:
   X-Y mode
   CH-1: Pin 2 (X) of AUDIO OUTPUT CH1 connector
   GND: Pin 1 (G) of it, AC
   CH-2: Pin 2 (X) of AUDIO OUTPUT CH2 connector
   GND: Pin 1 (G) of it, AC
   When the VTR is equipped with BKNW-105, connect the oscilloscope to the following connectors.
   CH-1: MONITOR OUTPUT L connector
   CH-2: MONITOR OUTPUT R connector

Note

An XLR-to-pigtail cable is very convenient to connect between the oscilloscope and the above-mentioned connectors.
Prepare two XLR-to-pigtail cables for this adjustment. And connect the XLR plug end of the cable to above-mentioned connectors and the pigtailed end to the oscilloscope. The cables for CH-1 and CH-2 shall be the same in length and same wire color on the pigtailed end.

2. For DNW-A100/A50/A45: Play back the 10 kHz, −10 VU portion (3:00 to 4:55) of the alignment tape CR8-1A in PLAY mode.
   For DNW-A100P/A50P/A45P: Play back the 15 kHz, 0 VU portion (3:00 to 4:55) of the alignment tape CR8-1B PS in PLAY mode.
3. Watch the lissajous waveform on the oscilloscope.
4. Align the vertical and horizontal amplitudes of lissajous waveform to 60 mm square with the VOLTS/DIV and VAR controls of the oscilloscope.
5. Minimize the phase difference A of lissajous waveform.
   Adj. point: ⊘RV603/APR-12(F-1)
   Specification: A ≦ 5.2 mm (Refer to Figure 3.)

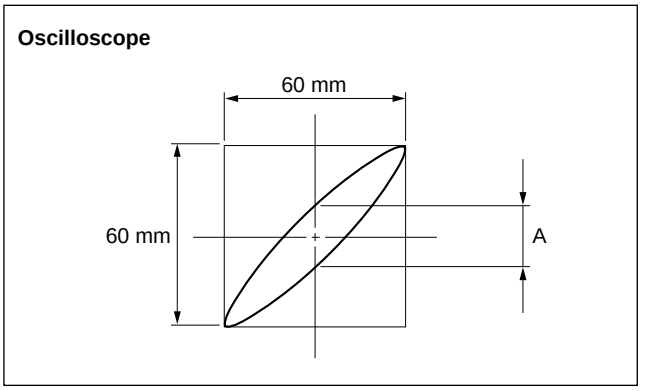


Figure 3. Lissajous Waveform of LAU PB Phase Adjustment

3-7. Video System Alignment (VPR-17 Board)

3-7-1. Adjustment Overview

When the VPR-17 board was replaced or repaired, perform the video system alignment. The adjustments are the manually adjustments using the menu of the maintenance mode.

Notes

- In the DNW-A100/A50/A45, be sure to adjust in 525/60 system before 625/50 system.
  In the DNW-A100P/A50P/A45P, be sure to adjust in 625/50 system before 525/60 system.
- For the video system of the analog Betacam PB, refer to Section 3-8.
- For the composite video input line (by option BKDW-505/506), refer to Section 4-1.
- For the component video input line (by option BKNW-104), refer to Section 4-3.

Note

For detail of each menu in the maintenance mode, refer to Section 4 of the maintenance manual part 1.

In Section 3-7, expresses the 525/60 and 625/50 systems as follows:

Video system	DNW-A100/A50/A45	DNW-A100P/A50P/A45P
525/60	Standard system	Another system
625/50	Another system	Standard system

Tools List

To perform the video system alignment for the VTR, prepare the following equipment and fixtures.

- Analog composite video signal generator (Sign is SG1.)
  For DNW-A100/A50/A45:
  TEKTRONIX TSG-170A or equivalent
  For DNW-A100P/A50P/A45P:
  TEKTRONIX TSG-271 or equivalent
- Analog composite video signal generator (Sign is SG2.)
  For DNW-A100/A50/A45:
  TEKTRONIX 1410 or equivalent
  For DNW-A100P/A50P/A45P:
  TEKTRONIX 1411 or equivalent
- Analog composite waveform/vector monitor
  For DNW-A100/A50/A45:
  TEKTRONIX 1750, 1780R, or equivalent
  For DNW-A100P/A50P/A45P:
  TEKTRONIX 1751, 1781R, or equivalent
- Oscilloscope: TEKTRONIX 2465B or equivalent
- Analog component waveform monitor:
  TEKTRONIX WFM-300 or equivalent
- Frequency counter:
  ADVANTEST TR5821AK or equivalent
- Analog composite video monitor
  (NTSC/PAL switchable type)

  Note

  This monitor is for menu displaying. Be sure to connect it to VIDEO OUTPUT COMPOSITE 3 (SUPER) connector.
- Extension board: EX-555 (Part No. A-8277-211-A)
- 75 Ω terminators (3 pieces)
- 75 Ω BNC T adapter

Adjustment Items

No.	Item		Adjustment point	Remarks
3-7-2	Preparation in standard system			DNW-A100/A50/A45: 525/60 system DNW-A100P/A50P/A45P: 625/50 system
3-7-3	Composite video output level adjustment			
		CH1/CH2	A20 : VPR VR : VIDEO 1/2 LEVEL	VIDEO OUTPUT COMPOSITE 1/2
		CH3	A20 : VPR VR : VIDEO 3 LEVEL	VIDEO OUTPUT COMPOSITE 3
		Data save	A2F : NV-RAM CONTROL	
3-7-4	Component video output adjustment			
		Y	A20 : VPR VR : Y OUTPUT LEVEL	VIDEO OUTPUT COMPONENT Y
		R-Y	A20 : VPR VR : R-Y OUTPUT LEVEL	VIDEO OUTPUT COMPONENT R-Y
		B-Y	A20 : VPR VR : B-Y OUTPUT LEVEL	VIDEO OUTPUT COMPONENT B-Y
		Data save	A2F : NV-RAM CONTROL	
		Output phase check		VIDEO OUTPUT COMPONENT
3-7-5	Component video output (Betacam) level adjustment			For 525/60 system only
		R-Y	A20 : VPR VR : B-CAM R-Y OUT LEVEL	VIDEO OUTPUT COMPONENT R-Y
		B-Y	A20 : VPR VR : B-CAM B-Y OUT LEVEL	VIDEO OUTPUT COMPONENT B-Y
		Data save	A2F : NV-RAM CONTROL	
3-7-6	Reference color frame pulse check			If the specification is not satisfied, change the adjustment data.
			A20 : VPR VR : REF 1st FLD DET	TP502/VPR-17(F-3)
		Data save	A2F : NV-RAM CONTROL	
3-7-7	Internal 4fsc frequency adjustment			
			A20 : VPR VR : INT 4Fsc FREQ	TP501/VPR-17(A-1)
		Data save	A2F : NV-RAM CONTROL	
3-7-8	Preparation in another system			DNW-A100/A50/A45: 625/50 system DNW-A100P/A50P/A45P: 525/60 system
3-7-9	Composite video output level adjustment			
		CH1/CH2	A20 : VPR VR : VIDEO 1/2 LEVEL	VIDEO OUTPUT COMPOSITE 1/2
		CH3	A20 : VPR VR : VIDEO 3 LEVEL	VIDEO OUTPUT COMPOSITE 3
		Data save	A2F : NV-RAM CONTROL	
3-7-10	Component video output adjustment			
		Y	A20 : VPR VR : Y OUTPUT LEVEL	VIDEO OUTPUT COMPONENT Y
		R-Y	A20 : VPR VR : R-Y OUTPUT LEVEL	VIDEO OUTPUT COMPONENT R-Y
		B-Y	A20 : VPR VR : B-Y OUTPUT LEVEL	VIDEO OUTPUT COMPONENT B-Y
		Data save	A2F : NV-RAM CONTROL	
		Output phase check		VIDEO OUTPUT COMPONENT
3-7-11	Component video output (Betacam) level adjustment			For DNW-A100P/A50P/A45P only
		R-Y	A20 : VPR VR : B-CAM R-Y OUT LEVEL	VIDEO OUTPUT COMPONENT R-Y
		B-Y	A20 : VPR VR : B-CAM B-Y OUT LEVEL	VIDEO OUTPUT COMPONENT B-Y
		Data save	A2F : NV-RAM CONTROL	

3-7-2. Preparation in Standard System

1. Set the VTR's switches as follows:

Location	Item	Customer setting		Setting at adjustment
SS-63 board	DIP switch S1100-1 (J-1) **Note** Set to ON to treat the extended menu of the setup menu.	_____	⇨	ON (Set to the up position)
Sub control panel	CHARACTER switch	_____	⇨	ON
	PROCESS CONTROL switch	_____	⇨	LOCAL
	• VIDEO switch	_____	⇨	PRESET
	• CHROMA switch	_____	⇨	PRESET
	• SET UP or BLACK LEVEL switch	_____	⇨	PRESET
	• Y/C DELAY switch	_____	⇨	PRESET
	• CHROMA PHASE switch	_____	⇨	PRESET
Connector panel	REF. VIDEO 75 Ω switch	_____	⇨	OFF (Set to the down position)

2. Set the following mode of the analog composite monitor.
   DNW-A100/A50/A45: NTSC
   DNW-A100P/A50P/A45P: PAL
3. Check that the operation system is setting as follows:
   DNW-A100/A50/A45: 525/60 system
   DNW-A100P/A50P/A45P: 625/50 system
   If differed, change the operation system in the setup menu ITEM-013 before adjusting.
   (For the ITEM-013, refer to Section 7-2-2 of the operation manual.)
4. For the DNW-A100/A50/A45 only:
   Set the ITEM-709 and -713 in the setup extended menu as follows:

ITEM No.	SUB-ITEM	Customer setting		Setting at adjustment
709 : CAV LEVEL FORMAT	1. OUTPUT CAV LEVEL	_____	⇨	B-CAM
713 : VIDEO SETUP REFERENCE LEVEL	4. OUTPUT LEVEL	_____	⇨	0.0%

5. When extending the VPR-17 board with an extension board, stop the extending.
   Notes
   - If stopping the extension to the VPR-17 board, wait more than 30 seconds after turning off the POWER switch, then remove the VPR-17 board.
   - The extension board is used in the following sections only.
     Section 3-7-6: Reference color frame pulse check
     Section 3-7-7: Internal 4fsc frequency adjustment

3-7-3. Composite Video Output Adjustment (Standard System)

Note

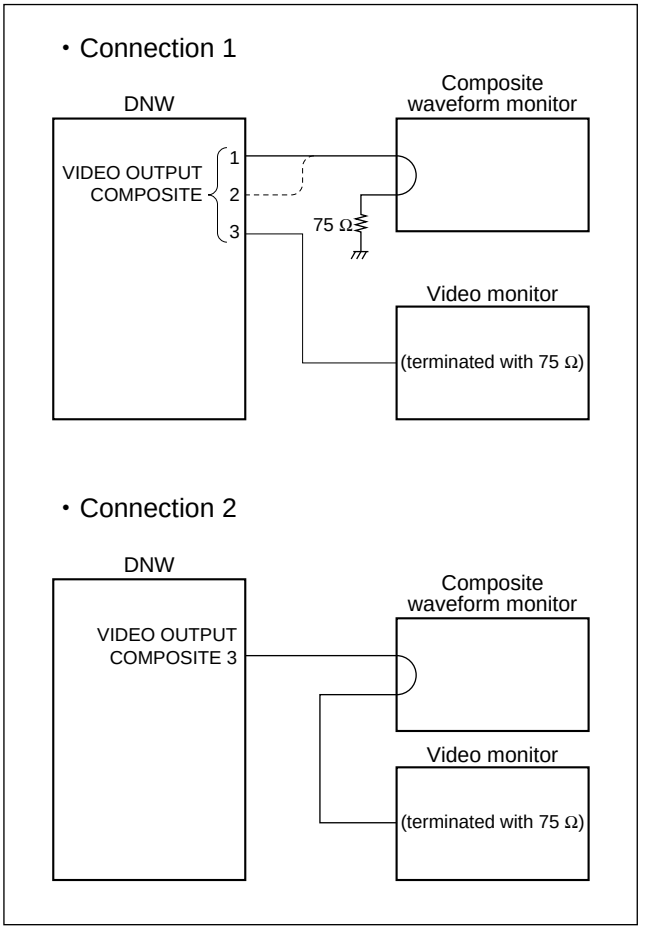
For the composite video output adjustment in the another system, refer to Section 3-7-9.

Preparing tools

- Analog composite waveform monitor
  For DNW-A100/A50/A45:
  TEKTRONIX 1750, 1780R, or equivalent
  For DNW-A100P/A50P/A45P:
  TEKTRONIX 1751, 1781R, or equivalent
- Analog composite video monitor

  Note

  This monitor is for menu displaying. Be sure to connect it to VIDEO OUTPUT COMPOSITE 3 (SUPER) connector otherwise note.
- 75 Ω terminator



Connections

Preparation

1. Check the switch setting on the SS-63 board.
S1100-1(J-1) switch ⇨ ON

2. Check the settings on the sub control panel.
CHARACTER switch ⇨ ON
PROCESS CONTROL switch ⇨ LOCAL
- VIDEO switch ⇨ PRESET
- CHROMA switch ⇨ PRESET
- SET UP or BLACK LEVEL switch ⇨ PRESET
- Y/C DELAY switch ⇨ PRESET
- CHROMA PHASE switch ⇨ PRESET

3. Connect the analog composite waveform monitor as shown Connection 1 on Figure "Connections".

4. Check the setup extend menu setting. (For the DNW-A100/A50/A45 only)
ITEM-713 : VIDEO SETUP REFERENCE LEVEL
4. OUTPUT LEVEL ⇨ 0.0%

5. Check that the equipment has warmed up.
Before starting the adjustment, warm up the VTR and composite waveform monitor through the power for 30 minutes or more.

6. Stop the extending of the VPR-17 board.
In this adjustment, be sure to perform without using the extension board.

Note

If stopping the extension to the VPR-17 board, wait more than 30 seconds after turning off the POWER switch, before removing the VPR-17 board.

Output Level Adjustment

1. To enter the maintenance mode, press S1101(G-1) on the SS-63 board.
2. In C21 : VIDEO TEST SG of the maintenance mode, select the following test signal.
   DNW-A100/A50/A45: 75% Color Bars
   DNW-A100P/A50P/A45P: 100% Color Bars
3. To exit the C2 : AUDIO/VIDEO CHECK, press the MENU button two times.
4. Enter A20 : VPR VR of the maintenance mode.

Check (Adjustment)

5. Connect the analog composite waveform monitor to each VIDEO OUTPUT COMPOSITE connector, then check the white peak level.
   If the specification is not satisfied, perform the adjustment.

   Notes
   - The outputs of VIDEO OUTPUT COMPOSITE 1 and 2 connectors cannot adjust separately.
   - When checking/adjusting the output of VIDEO OUTPUT COMPOSITE 3 (SUPER) connector, change the connection of the video monitor as Connection 2 on the opposite page.
   - The menu picture of the maintenance mode is superimposed in the output of VIDEO OUTPUT COMPOSITE 3 (SUPER) connector. If the superimposed picture obstructs, set the CHARACTER switch on the sub control panel to OFF. (Be sure to return it to ON after checking/adjusting.)

6. To exit A20 : VPR VR, press the MENU button once.

Data save (Store the adjusted data)

When the adjustment was not performed in step 5, skip over to step 9.

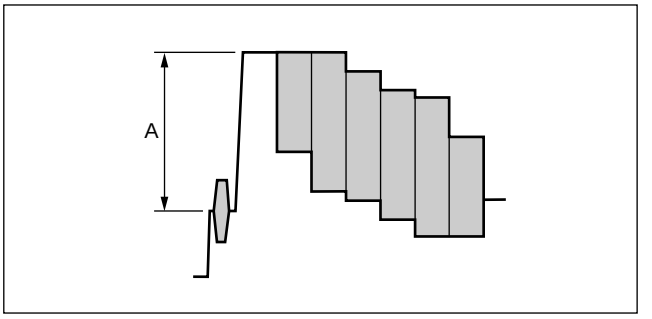
7. Enter A2F : NV-RAM CONTROL, then execute "SAVE ALL ADJUST DATA".
   - Message "Save Complete" is displayed on the video monitor when this data save is completed normally.

   Note

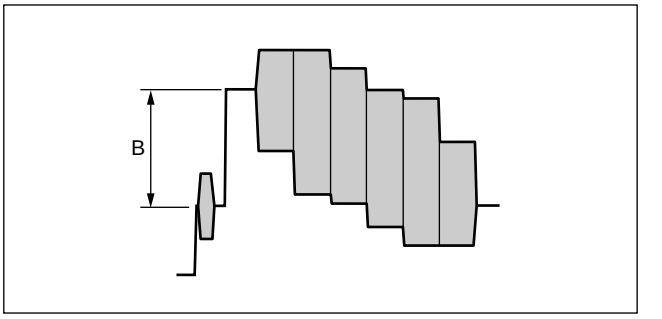
   When loading the previous data without save the current adjusted data, execute "ALL DATA PREVIOUS".
8. To exit A2F : NV-RAM CONTROL, press the MENU button once.

9. To exit the maintenance mode, press the MENU button three times.

Output channel [Connection]	Adjustment point (A20 : VPR VR)	Specification for DNW-A100/A50/A45	Specification for DNW-A100P/A50P/A45P
COMPOSITE 1 [Connection 1]	VIDEO 1/2 LEVEL	A = 100 ±1 IRE	B = 700 ±7 mV
COMPOSITE 2 [Connection 1]	VIDEO 1/2 LEVEL	(A = 714 ±7 mV)	
COMPOSITE 3 [Connection 2]	VIDEO 3 LEVEL		



DNW-A100/A50/A45



DNW-A100P/A50P/A45P

3-7-4. Component Video Output Adjustment (Standard System)

Note

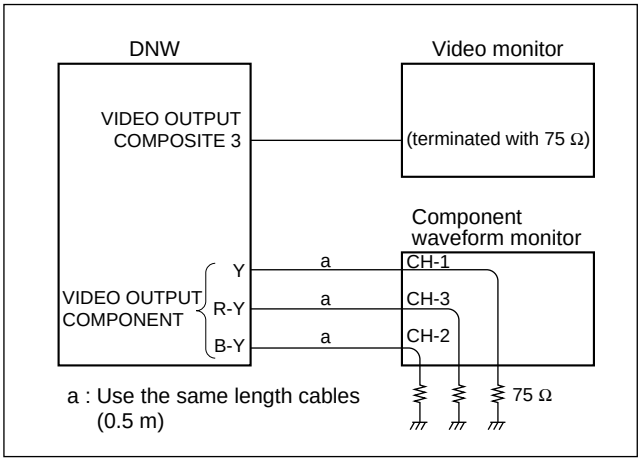
For the composite video output adjustment in the another system, refer to Section 3-7-10.

Preparing tools

- Analog component waveform monitor
  TEKTRONIX WFM300 or equivalent
- Analog composite video monitor

  Note

  This monitor is for menu displaying. Be sure to connect it to VIDEO OUTPUT COMPOSITE 3 (SUPER) connector.
- 75 Ω terminators (3 pieces)



Connection

Preparation

1. Check the switch setting on the SS-63 board.

S1100-1(J-1) switch ⇨ ON

2. Check the settings on the sub control panel.

CHARACTER switch ⇨ ON
PROCESS CONTROL switch ⇨ LOCAL
- VIDEO switch ⇨ PRESET
- CHROMA switch ⇨ PRESET
- SET UP or BLACK LEVEL switch ⇨ PRESET
- Y/C DELAY switch ⇨ PRESET
- CHROMA PHASE switch ⇨ PRESET

3. Connect the analog component waveform monitor as shown Figure "Connection".

4. Check the setup extend menu settings. (For the DNW-A100/A50/A45 only)

ITEM-709 : CAV LEVEL FORMAT
1. OUTPUT CAV LEVEL ⇨ D-1
ITEM-713 : VIDEO SETUP REFERENCE LEVEL
4. OUTPUT LEVEL ⇨ 0.0%

5. Check that the equipment has warmed up.

Before starting the adjustment, warm up the VTR and component waveform monitor through the power for 30 minutes or more.

6. Stop the extending of the VPR-17 board.

In this adjustment, be sure to perform without using the extension board.

Note

If stopping the extension to the VPR-17 board, wait more than 30 seconds after turning off the POWER switch, before removing the VPR-17 board.

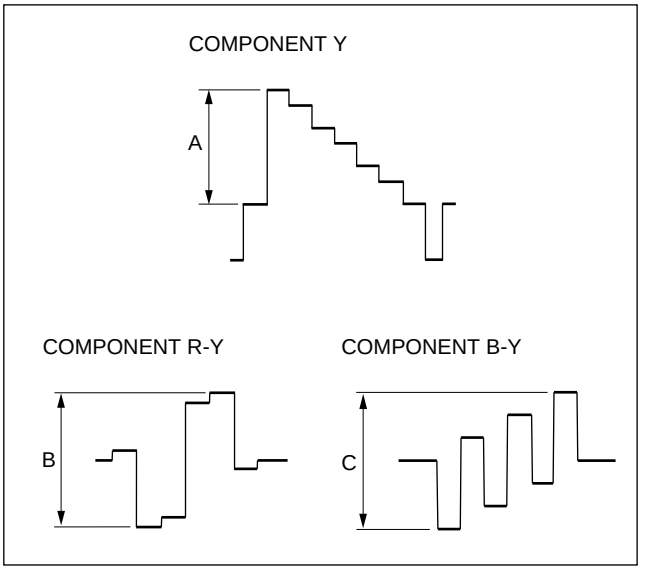
1. Output Level Adjustment

1. To enter the maintenance mode, press S1101(G-1) on the SS-63 board.
2. In C21 : VIDEO TEST SG of the maintenance mode, select the test signal “100% Color Bars”.
3. To exit the C2 : AUDIO/VIDEO CHECK, press the MENU button two times.
4. Enter A20 : VPR VR of the maintenance mode.

Check (Adjustment)

5. Check each specified part’s level of VIDEO OUTPUT COMPONENT outputs on the waveform monitor. If the specification is not satisfied, perform the adjustment.

Output	Adj. point (A20 : VPR VR)	Specification
Y	Y OUTPUT LEVEL	A = 700 ±7 mV
R-Y	R-Y OUTPUT LEVEL	B = 700 ±7 mV p-p
B-Y	B-Y OUTPUT LEVEL	C = 700 ±7 mV p-p



6. To exit A20 : VPR VR, press the MENU button once.

Data save (Store the adjusted data)

When the adjustment was not performed in step 5, skip over steps 7 and 8.

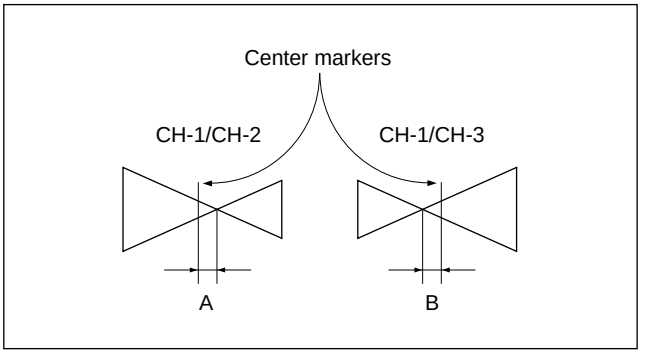
7. Enter A2F : NV-RAM CONTROL, then execute “SAVE ALL ADJUST DATA”.
   - Message “Save Complete” is displayed on the video monitor when this data save is completed normally.

   Note

   When loading the previous data without save the current adjusted data, execute “ALL DATA PREVIOUS”.
8. To exit A2F : NV-RAM CONTROL, press the MENU button once.

2. Output Phase Check

1. To exit the A2 : AUDIO/VIDEO ADJUST, press the MENU button once.
2. In C21 : VIDEO TEST SG of the maintenance mode, select the test signal “Bowtie”.
3. To exit the C2 : AUDIO/VIDEO CHECK, press the MENU button two times.
4. Set the analog component waveform monitor to the BOWTIE mode.
5. Check the deviations A and B between each center marker and bowtie dip point of CH-1/CH-2 (Y/B-Y) and CH-1/CH-3 (Y/R-Y).
   Specifications: A = 0 ± 10 ns
   B = 0 ± 10 ns



6. To exit the maintenance mode, press the MENU button two times.

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3-7-5. Component Video Output (Betacam) Adjustment (525/60 System)

Notes

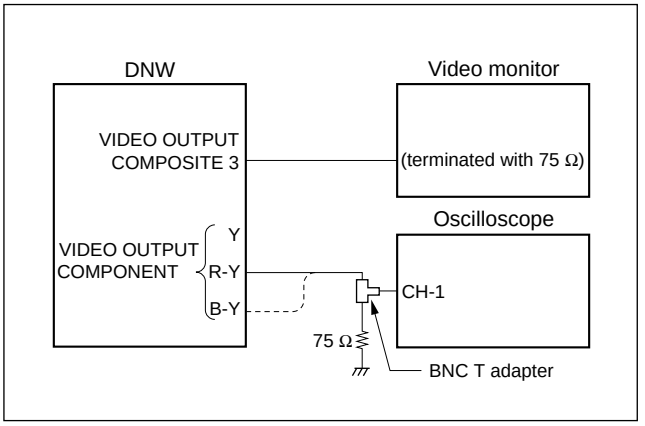
- Be sure to perform this adjustment when the VTR operates in the 525/60 system.
- For the DNW-A100P/A50P/A45P, be sure to perform this adjustment after Section 3-7-10 is completed.

Preparing tools

- Oscilloscope: TEKTRONIX 2465B or equivalent
- Analog composite video monitor

  Note

  This monitor is for menu displaying. Be sure to connect it to VIDEO OUTPUT COMPOSITE 3 (SUPER) connector.
- 75 Ω terminator
- 75 Ω BNC T adapter



Connection

Preparation

1. Check the switch setting on the SS-63 board.

S1100-1(J-1) switch ⇨ ON

2. Check the settings on the sub control panel.

CHARACTER switch ⇨ ON
PROCESS CONTROL switch ⇨ LOCAL
- VIDEO switch ⇨ PRESET
- CHROMA switch ⇨ PRESET
- SET UP or BLACK LEVEL switch ⇨ PRESET
- Y/C DELAY switch ⇨ PRESET
- CHROMA PHASE switch ⇨ PRESET

3. Connect the oscilloscope as shown Figure "Connection".

4. Check the setup extend menu settings.

ITEM-709 : CAV LEVEL FORMAT
1. OUTPUT CAV LEVEL ⇨ B-CAM
ITEM-713 : VIDEO SETUP REFERENCE LEVEL
4. OUTPUT LEVEL ⇨ 0.0%

5. Check that the equipment has warmed up.

Before starting the adjustment, warm up the VTR and oscilloscope through the power for 30 minutes or more.

6. Stop the extending of the VPR-17 board.

In this adjustment, be sure to perform without using the extension board.

Note

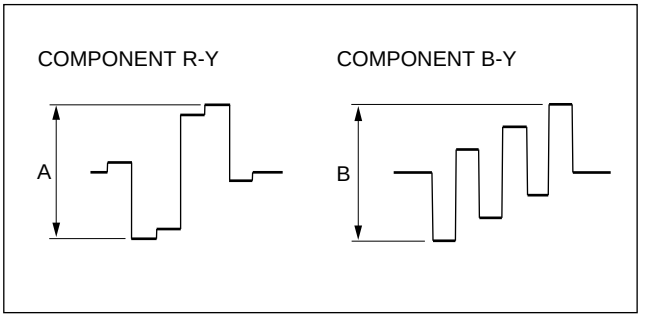
If stopping the extension to the VPR-17 board, wait more than 30 seconds after turning off the POWER switch, before removing the VPR-17 board.

Output Level Adjustment

1. To enter the maintenance mode, press S1101(G-1) on the SS-63 board.
2. In C21 : VIDEO TEST SG of the maintenance mode, select the test signal “75% Color Bars”.
3. To exit the C2 : AUDIO/VIDEO CHECK, press the MENU button two times.
4. Enter A20 : VPR VR of the maintenance mode.

Check (Adjustment)

5. Set the oscilloscope as follows:
   Band width limit: ON
   CH-1: DC 100 mV/DIV
   TIME: 10 μs/DIV
   TRIG: CH-1
6. Connect the oscilloscope’s CH-1 input to VIDEO OUTPUT COMPONENT R-Y connector, then check the output level.
   If the specification is not satisfied, perform the adjustment.
   Adj. point: A20 : VPR VR : R-Y OUTPUT LEVEL
   Specification: A = 757 ±7 mV p-p
7. Connect the oscilloscope’s CH-1 input to VIDEO OUTPUT COMPONENT B-Y connector, then check the output level.
   If the specification is not satisfied, perform the adjustment.
   Adj. point: A20 : VPR VR : B-Y OUTPUT LEVEL
   Specification: B = 757 ±7 mV p-p



8. To exit A20 : VPR VR, press the MENU button once.

Data save (Store the adjusted data)

When the adjustment was not performed in both step 6 and step 7, skip over to step 11.

9. Enter A2F : NV-RAM CONTROL, then execute “SAVE ALL ADJUST DATA”.
   • Message “Save Complete” is displayed on the video monitor when this data save is completed normally.

   Note

   When loading the previous data without save the current adjusted data, execute “ALL DATA PREVIOUS”.
10. To exit A2F : NV-RAM CONTROL, press the MENU button once.

11. To exit the maintenance mode, press the MENU button three times.

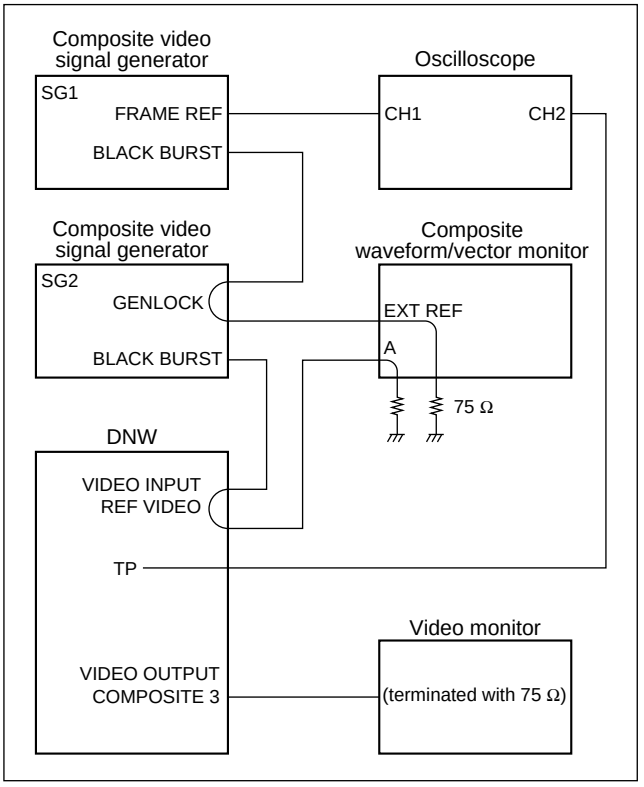
3-7-6. Reference Color Frame Pulse Check (Standard System only)

Note

Be sure to check in the standard system.

Preparing tools

- Analog composite video signal generator (Sign is SG1.)
  For DNW-A100/A50/A45:
  TEKTRONIX TSG-170A or equivalent
  For DNW-A100P/A50P/A45P:
  TEKTRONIX TSG-271 or equivalent
- Analog composite video signal generator (Sign is SG2.)
  For DNW-A100/A50/A45:
  TEKTRONIX 1410 or equivalent
  For DNW-A100P/A50P/A45P:
  TEKTRONIX 1411 or equivalent
- Analog composite waveform/vector monitor
  For DNW-A100/A50/A45:
  TEKTRONIX 1750, 1780R, or equivalent
  For DNW-A100P/A50P/A45P:
  TEKTRONIX 1751, 1781R, or equivalent
- Oscilloscope: TEKTRONIX 2465B or equivalent
- Analog composite video monitor
- Extension board: EX-555 (Part No. A-8277-211-A)
- 75 Ω terminators (2 pieces)



Connection

Preparation

1. Extend the VPR-17 board with an extension board EX-555.

Note

Before removing VPR-17 board, wait more than 30 seconds after turning off the POWER switch.

2. Check the setting on the sub control panel.

CHARACTER switch ⇨ ON

3. Connect the equipment as shown Figure "Connection".

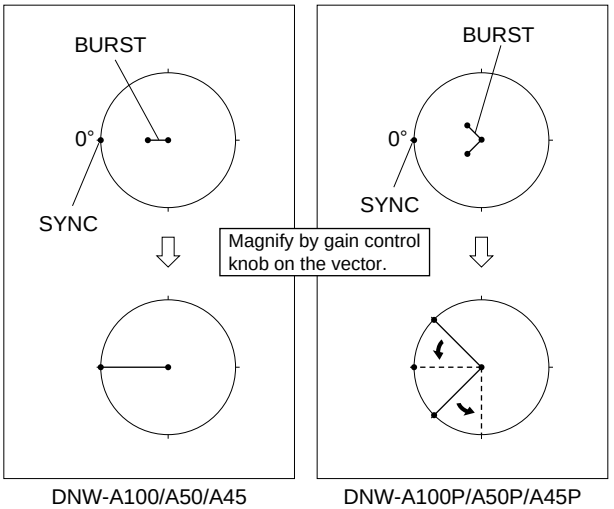
4. Check that the equipment has warmed up.

Before starting the adjustment, warm up the VTR and other equipment through the power for 30 minutes or more.

Setting of Composite Waveform/Vector Monitor

In this section, the analog composite waveform/vector monitor is abbreviated "vector" for short.

1. Set the vector as follows:
   SCH mode, INPUT: CH-A, EXT REF
2. Align the SYNC phase to 0 degree using the vector's PHASE knob so that the beam spot (SYNC) moves in the shortest route. (Refer to below figure.)
3. Align the BURST to regular potion on the vector using the signal generator SG2's SC PHASE knob.
4. Align the BURST's beam spot(s) to the circle scale on the vector using the gain control (knob) on the vector.
5. For DNW-A100P/A50P/A45P only: Align the BURST to the specified positions as the dotted lines of right figure using the vector's PHASE knob.



DNW-A100/A50/A45 DNW-A100P/A50P/A45P

Reference Color Frame Pulse Check

1. To enter the maintenancemode, press S1101 (G-1) on the SS-63 board.
2. Enter A20 : VPR VR.
3. Connect and set the oscilloscope as follows:
   ALT display mode
   CH-2: TP502/VPR-17(F-3), DC 2 V/DIV
   GND: E501/VPR-17(G-1)
   TIME: 10 ms/DIV for DNW-A100/A50/A45
   20 ms/DIV for DNW-A100P/A50P/A45P
   TRIG: CH-1: DC 2 V/DIV
   (Connected SG2's FRAME REF output)
4. Turn the signal generator SG2's SC PHASE control knob clockwise (↻) slowly until the waveform of the oscilloscope's CH-2 (TP502) changes from ⓐ to ⓑ.
5. Measure the BURST phase (angle A) on the vector when just inverted the phase of CH-2 (TP502) on the oscilloscope.
6. To return the position of the BURST signal to be displayed on the vector, turn SG2's SC PHASE control knob counterclockwise (↺).
7. Turn the signal generator SG2's SC PHASE control knob counterclockwise (↺) slowly until the waveform of the oscilloscope's CH-2 (TP502) changes from ⓐ to ⓑ.
8. Measure the BURST phase (angle B) on the vector when just inverted the phase of CH-2 (TP502) on the oscilloscope.
9. To return the position of the BURST signal to be displayed on the vector, turn SG2's SC PHASE control knob clockwise (↻).
10. Confirm that the difference between the angles A and B is within specification.
    If the specification is not satisfied, perform steps (1) through (4).
    Specification: A − B = 0 ±10°
11. To exit the A20 : VPR VR, press the MENU button once.

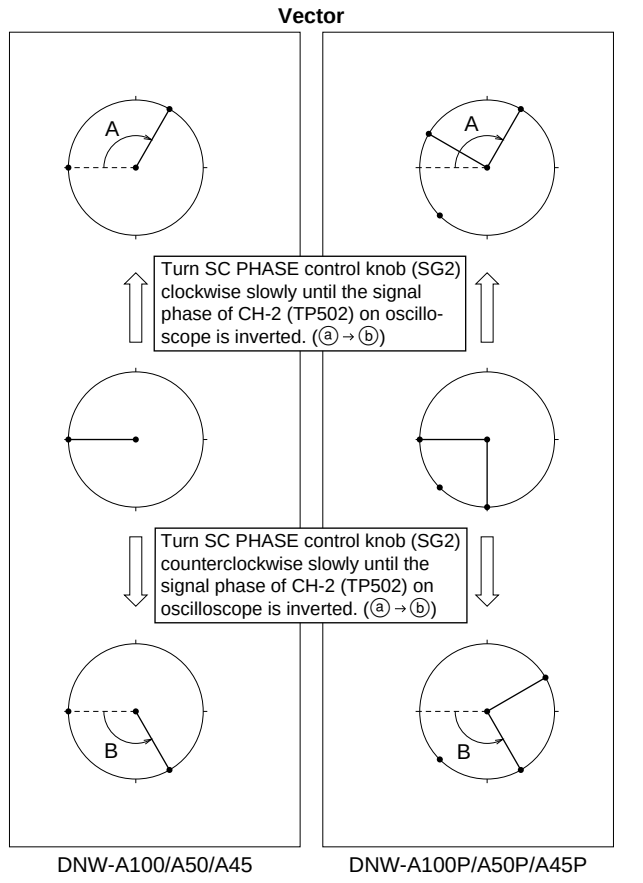
Perform following steps (1) and (2) when the specification in step 10 was not satisfied.

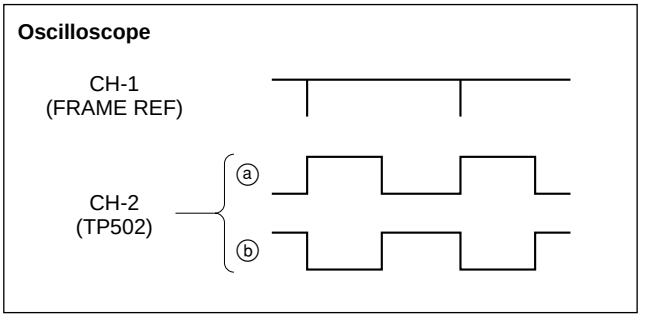
(1) Add/subtract 1 to/from the data value of "REF 1ST FLD DET".

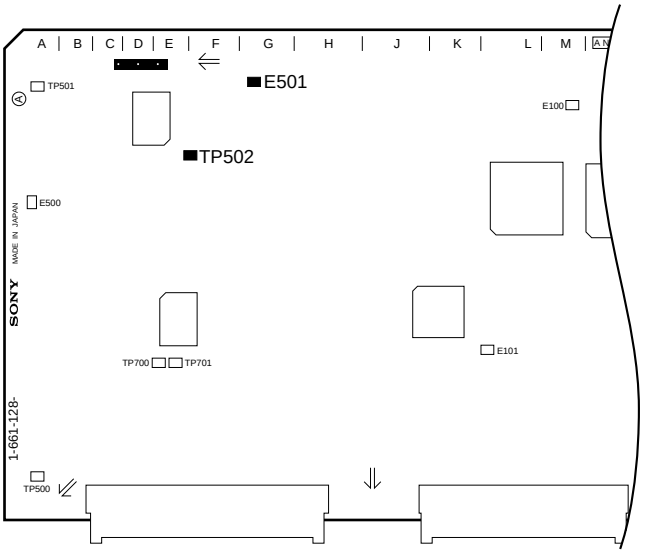
Note

The data increase/decrease is dependent on the angles A and B measured in steps 5 and 8.
A > B : Subtract 1 from the data value.
A < B : Add 1 to the data value.

(2) Return to step 4.


Vector
A
A
Turn SC PHASE control knob (SG2) clockwise slowly until the signal phase of CH-2 (TP502) on oscilloscope is inverted. (ⓐ→ⓑ)
Turn SC PHASE control knob (SG2) counterclockwise slowly until the signal phase of CH-2 (TP502) on oscilloscope is inverted. (ⓐ→ⓑ)
B
B
DNW-A100/A50/A45
DNW-A100P/A50P/A45P





VPR-17 Board (Side A)

Data save (Store the adjusted data)

When the data of "REF 1ST FLD DET" in A20 : VPR VR was not changed, skip over to step 14.

12. Enter A2F : NV-RAM CONTROL, then execute "SAVE ALL ADJUST DATA".
    - Message "Save Complete" is displayed on the video monitor when this data save is completed normally.

    Note

    When loading the previous data without save the current adjusted data, execute "ALL DATA PREVIOUS".
13. To exit A2F : NV-RAM CONTROL, press the MENU button once.

14. To exit the maintenance mode, press the MENU button three times.

3-7-7. Internal 4fsc Frequency Adjustment

Note

Be sure to check under the standard system.

Preparing tools

- Frequency counter:
  ADVANTEST TR5821AK or equivalent
- Analog composite video monitor
  (NTSC/PAL switchable type)

  Note

  This monitor is for menu displaying. Be sure to connect it to VIDEO OUTPUT COMPOSITE 3 (SUPER) connector.
- Extension board: EX-555 (Part No. A-8277-211-A)

Preparation

1. Extend the VPR-17 board with an extension board EX-555.

Note

Before removing the VPR-17 board, wait more than 30 seconds after turning off the POWER switch.

2. Check the setting on the sub control panel.

CHARACTER switch ⇨ ON

3. Check that the equipment has warmed up.

Before starting the adjustment, warm up the VTR and frequency counter through the power for 30 minutes or more.

Frequency Adjustment

1. Supply no signal to REF. VIDEO connector. (or non connection)
2. Connect the frequency counter to TP501(A-1) on the VPR-17 board. GND: E500/VPR-17(A-5)
3. To enter the maintenance mode, press S1101 (G-1) on the SS-63 board.
4. Enter A20 : VPR VR of the maintenance mode.
5. Adjust the frequency on the frequency counter.
   Adj. point: A20 : VPR VR : INT 4FSC FREQ
   Specification:
   14,318,181 ±50 Hz for DNW-A100/A50/A45
   17,734,476 ±50 Hz for DNW-A100P/A50P/A45P
6. To exit A20 : VPR VR, press the MENU button once.

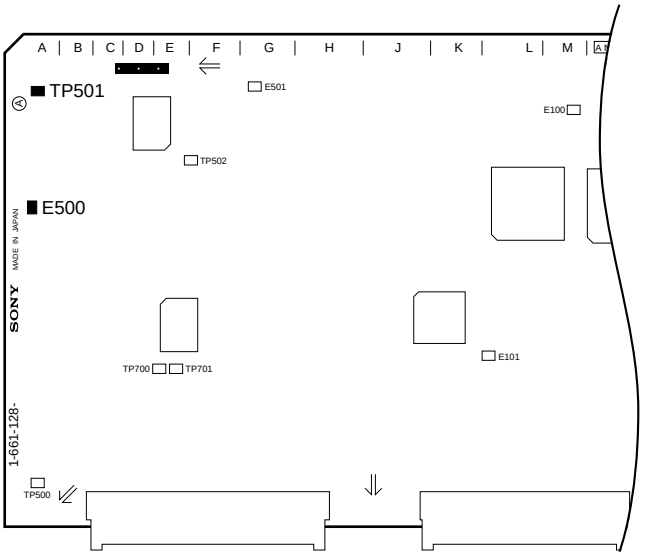
Data save (store the adjusted data)

7. Enter A2F : NV-RAM CONTROL, then execute "SAVE ALL ADJUST DATA".
   - Message "Save Complete" is displayed on the video monitor when this data save is completed normally.

   Note

   When loading the previous data without save the current adjusted data, execute "ALL DATA PREVIOUS".
8. To exit A2F : NV-RAM CONTROL, press the MENU button once.

9. To exit the maintenance mode, press the MENU button three times.



VPR-17 Board (Side A)

3-7-8. Preparation in Another System

Notes

- Be sure to perform the adjustments in the another system after completing the adjustments in the standard system.
- The settings of the VTR's switches are the same as the Preparation in standard system.

For the DNW-A100/A50/A45

1. Wait more than 30 seconds after turning off the POWER switch.
2. Stop the extending of the VPR-17 board.
3. Turn on the POWER switch
4. Return the following SUB-ITEM settings of the ITEM-709 and -723 in the setup extend menu to the customer settings.
   - 709 : CAV LEVEL FORMAT
     1. OUTPUT CAV LEVEL
   - 713 : VIDEO SETUP REFERENCE LEVEL
     4. OUTPUT LEVEL
5. Turn the video system to a 625/50 system using the setup menu ITEM-013 : 525/625 SYSTEM SELECT. (Refer to Section 7-2-2 of the operation manual.)
6. Set the analog composite monitor to the PAL mode.

For the DNW-A100P/A50P/A45P

1. Wait more than 30 seconds after turning off the POWER switch.
2. Stop the extending of the VPR-17 board.
3. Turn on the POWER switch
4. Turn the video system to a 525/60 system using the setup menu ITEM-013 : 525/625 SYSTEM SELECT. (Refer to Section 7-2-2 of the operation manual.)
5. Set the analog composite monitor to the NTSC mode.
6. Set the ITEM-709 and -713 in the setup extended menu as follows:

ITEM No. SUB-ITEM	Customer setting		Setting at adjustment
709 : CAV LEVEL FORMAT 1. OUTPUT CAV LEVEL	_____	⇨	B-CAM
713 : VIDEO SETUP REFERENCE LEVEL 4. OUTPUT LEVEL	_____	⇨	0.0%

3-7-9. Composite Video Output Adjustment (Another System)

Note

For the composite video output adjustment in the standard system, refer to Section 3-7-3.

Preparing tools

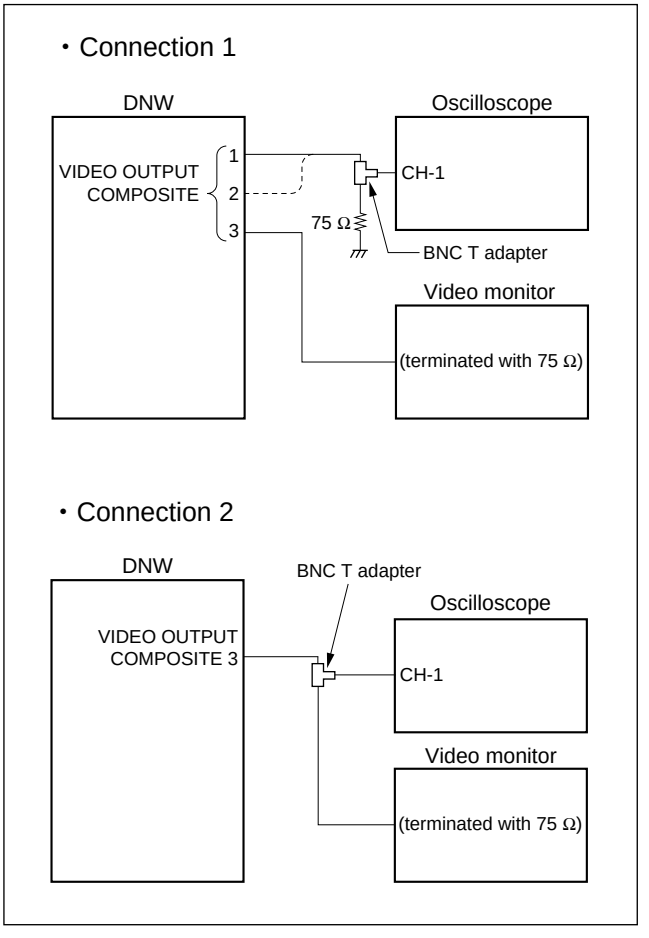
- Oscilloscope: TEKTRONIX 2465B or equivalent

  Note

  When you can prepare the following analog composite waveform monitor or equivalent, be sure to use it.
  In the DNW-A100/A50/A45:
  TEKTRONIX 1751 or 1781R (for 625/50 system)
  In the DNW-A100P/A50P/A45P:
  TEKTRONIX 1750 or 1780R (for 525/60 system)
- Analog composite video monitor

  Note

  This monitor is for menu displaying. Be sure to connect it to VIDEO OUTPUT COMPOSITE 3 (SUPER) connector otherwise note.
- 75 Ω terminator
- 75 Ω BNC T adapter (when using the oscilloscope)



Connections

Preparation

1. Check the switch setting on the SS-63 board.
S1100-1(J-1) switch ⇨ ON

2. Check the settings on the sub control panel.
CHARACTER switch ⇨ ON
PROCESS CONTROL switch ⇨ LOCAL
- VIDEO switch ⇨ PRESET
- CHROMA switch ⇨ PRESET
- SET UP or BLACK LEVEL switch ⇨ PRESET
- Y/C DELAY switch ⇨ PRESET
- CHROMA PHASE switch ⇨ PRESET

3. Connect the oscilloscope as shown Connection 1 on Figure "Connections".

Note

When using the analog composite waveform monitor, refer to Section 3-7-3 for the connection of it.

4. Check the setup extend menu setting. (For the DNW-A100P/A50P/A45P only)
ITEM-713 : VIDEO SETUP REFERENCE LEVEL
4. OUTPUT LEVEL ⇨ 0.0%

5. Check that the equipment has warmed up.
Before starting the adjustment, warm up the VTR and oscilloscope through the power for 30 minutes or more.

Output Level Adjustment

1. To enter the maintenance mode, press S1101(G-1) on the SS-63 board.
2. In C21 : VIDEO TEST SG of the maintenance mode, select the following test signal.
   DNW-A100/A50/A45: 100% Color Bars
   DNW-A100P/A50P/A45P: 75% Color Bars
3. To exit the C2 : AUDIO/VIDEO CHECK, press the MENU button two times.
4. Enter A20 : VPR VR of the maintenance mode.

Check (Adjustment)

5. Set the oscilloscope as follows:
   CH-1: DC 200 mV/DIV, 10 µs/DIV
   TRIG: CH-1, – slope, coupling: LINE
6. With the oscilloscope's CH-1 input connected to each VIDEO OUTPUT COMPOSITE connector, check the white peak level.
   If the specification is not satisfied, perform the adjustment.

   Notes

   - The outputs of VIDEO OUTPUT COMPOSITE 1 and 2 connectors cannot adjust separately.
   - When checking/adjusting the output of VIDEO OUTPUT COMPOSITE 3 (SUPER) connector, change the connection of the video monitor as Connection 2 on the opposite page.
   - The menu picture of the maintenance mode is superimposed in the output of VIDEO OUTPUT COMPOSITE 3 (SUPER) connector. If the superimposed picture obstructs, set the CHARACTER switch on the sub control panel to OFF. (Be sure to return it to ON after checking/adjusting.)
7. To exit A20 : VPR VR, press the MENU button once.

Data save (Store the adjusted data)

When the adjustment in step 6 was not performed, skip over to step 10.

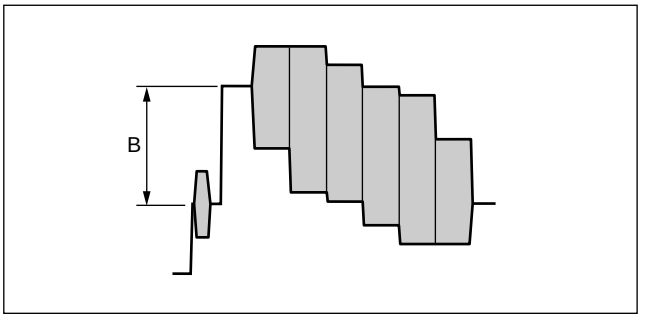
8. Enter A2F : NV-RAM CONTROL, then execute "SAVE ALL ADJUST DATA".
   - Message "Save Complete" is displayed on the video monitor when this data save is completed normally.

   Note

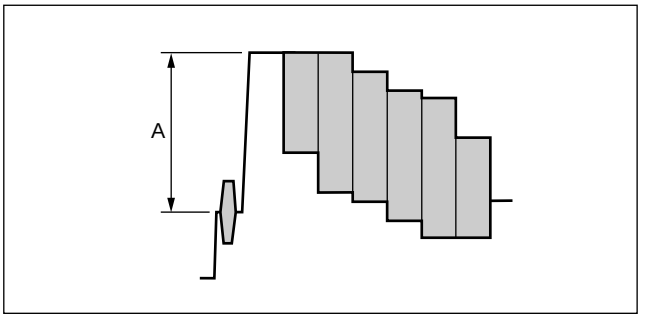
   When loading the previous data without save the current adjusted data, execute "ALL DATA PREVIOUS".
9. To exit A2F : NV-RAM CONTROL, press the MENU button once.

10. To exit the maintenance mode, press the MENU button three times.

Output channel [Connection]	Adjustment point (A20 : VPR VR)	Specification for DNW-A100/A50/A45	Specification for DNW-A100P/A50P/A45P
COMPOSITE 1 [Connection 1]	VIDEO 1/2 LEVEL	B = 700 ±7 mV	A = 714 ±7 mV
COMPOSITE 2 [Connection 1]	VIDEO 1/2 LEVEL		(A = 100 ±1 IRE)
COMPOSITE 3 [Connection 2]	VIDEO 3 LEVEL		



DNW-A100/A50/A45



DNW-A100P/A50P/A45P

3-7-10. Component Video Output Adjustment (Another System)

Note

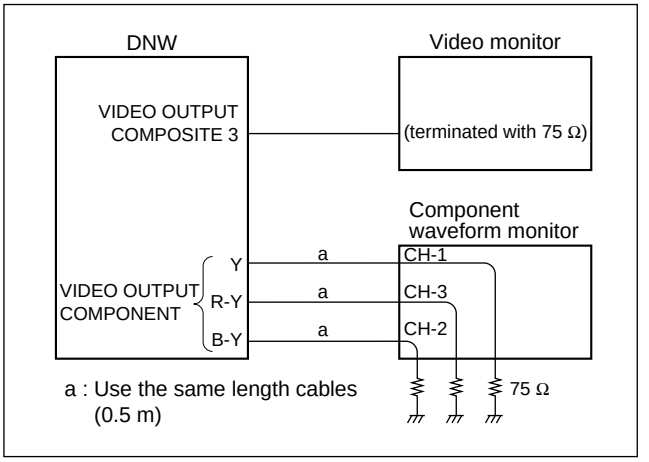
For the composite video output adjustment in the standard system, refer to Section 3-7-4.

Preparing tools

- Analog component waveform monitor
  TEKTRONIX WFM-300 or equivalent
- Analog composite video monitor

  Note

  This monitor is for menu displaying. Be sure to connect it to VIDEO OUTPUT COMPOSITE 3 (SUPER) connector on the connector panel.
- 75 Ω terminators (3 pieces)



Connection

Preparation

1. Check the switch setting on the SS-63 board.

S1100-1(J-1) switch ⇨ ON

2. Check the settings on the sub control panel.

CHARACTER switch ⇨ ON
PROCESS CONTROL switch ⇨ LOCAL
- VIDEO switch ⇨ PRESET
- CHROMA switch ⇨ PRESET
- SET UP or BLACK LEVEL switch ⇨ PRESET
- Y/C DELAY switch ⇨ PRESET
- CHROMA PHASE switch ⇨ PRESET

3. Connect the analog component waveform monitor as shown Figure "Connection".

4. Check the setup extend menu settings. (For the DNW-A100P/A50P/A45P only)

ITEM-709 : CAV LEVEL FORMAT
  1. OUTPUT CAV LEVEL ⇨ D-1
ITEM-713 : VIDEO SETUP REFERENCE LEVEL
  4. OUTPUT LEVEL ⇨ 0.0%

5. Check that the equipment has warmed up.

Before starting the adjustment, warm up the VTR and component waveform monitor through the power for 30 minutes or more.

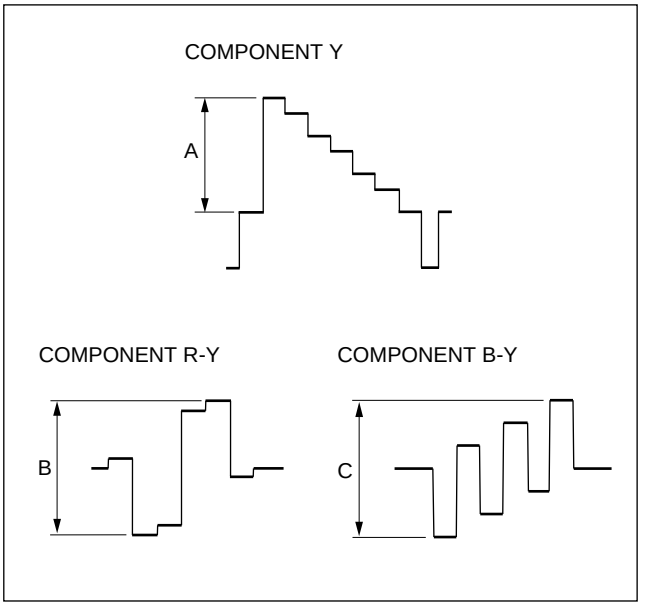
Output Level Adjustment

1. To enter the maintenance mode, press S1101(G-1) on the SS-63 board.
2. In C21 : VIDEO TEST SG of the maintenance mode, select the test signal “100% Color Bars”.
3. To exit the C2 : AUDIO/VIDEO CHECK, press the MENU button two times.
4. Enter A20 : VPR VR of the maintenance mode.

Check (Adjustment)

5. Check each specified part’s level of VIDEO OUTPUT COMPONENT outputs (Y/R-Y/B-Y) on the waveform monitor.
   If the specification is not satisfied, perform the adjustment.

Output	Adj. point (A20 : VPR VR)	Specification
Y	Y OUTPUT LEVEL	A = 700 ±7 mV
R-Y	R-Y OUTPUT LEVEL	B = 700 ±7 mV p-p
B-Y	B-Y OUTPUT LEVEL	C = 700 ±7 mV p-p



6. To exit A20 : VPR VR, press the MENU button once.

Data save (Store the adjusted data)

When the adjustment was not performed in step 5, skip over to step 9.

7. Enter A2F : NV-RAM CONTROL, then execute “SAVE ALL ADJUST DATA”.
   - Message “Save Complete” is displayed on the video monitor when this data save is completed normally.

   Note

   When loading the previous data without save the current adjusted data, execute “ALL DATA PREVIOUS”.
8. To exit A2F : NV-RAM CONTROL, press the MENU button once.

9. To exit the maintenance mode, press the MENU button three times.

3-7-11. Component Video Output (Betacam) Adjustment (for DNW-A100P/A50P/A45P only in 525/60 System)

For the component video output (Betacam) adjustment to DNW-A100P/A50P/A45P under 525/60 system, perform Section 3-7-5.

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3-8. Analog Betacam PB System Alignment

3-8-1. Adjustment Overview

Perform this section when aligning the video system in the analog Betacam PB system.
When aligning the audio system in the analog Betacam PB system, refer to Section 3-6.

Note

For NTSC model (DNW-A100/A50/A45), be sure to adjust in the 525/60 system.
For PAL model (DNW-A100P/A50P/A45P), be sure to adjust in the 625/50 system.
If differed, change the video system using the setup menu ITEM-013 before adjusting. (For the ITEM-013, refer to Section 7-2-2 of the operation manual.)

In this Section 3-8, perform the adjustments for the following boards. For adjustment items and its order, refer to “Adjustment Items” (next page).

- DM-89 board
- EQ-56 board
- TBC-23 board
- TBC-24 board

Tools List

To perform the analog Betacam PB system alignment, prepare the following equipment and fixtures.

- Analog composite video signal generator
  For NTSC: TEKTRONIX TSG-170A or equivalent
  For PAL: TEKTRONIX TSG-271 or equivalent
- Analog component video signal generator:
  TEKTRONIX TSG-300 or equivalent

  Note

  It is required that the component video signal generator is able to output the 50% bowtie signal.
- Analog composite waveform/vector monitor
  For NTSC: TEKTRONIX 1750, 1780R, or equivalent
  For PAL: TEKTRONIX 1751, 1781R, or equivalent
- Analog component waveform monitor:
  TEKTRONIX WFM300 or equivalent
- Oscilloscope: TEKTRONIX 2465B or equivalent
- Spectrum analyzer:
  ADVANTEST R3261A or equivalent
- Network analyzer:
  ANRITSU MS420B or equivalent
- Digital voltmeter:
  ADVANTEST TR6845 or equivalent
- VISC phase adjustment tool (for PAL model only)
  (Part No. J-6332-240-A)
- Analog component video monitor

  Note

  This video monitor is for menu displaying. Be sure to connect it to VIDEO OUTPUT COMPOSITE 3 (SUPER) connector.
- Extension harness: 14P (Part No. 1-952-684-11)
- Extension board: EX-377 (Part No. J-6269-810-A)
- Cleaning tape: BCT-5CLN
  (SONY standard products)
- Alignment tapes
  For NTSC: CR5-1B (Part No. 8-960-096-41) and
  CR5-2A (Part No. 8-960-097-44)
  For PAL: CR5-1B PS (Part No. 8-960-096-91) and
  CR5-2A PS (Part No. 8-960-098-44)
- 75 Ω terminators (5 pieces)
- Shorting clips (2 pieces)

Adjustment Items

No.	Item		Adjustment point	Remarks
3-8-3	Initial data setting	All data of A3 : BETACAM PB ADJUST		
3-8-4	EQ RF output level adjustment			
		METAL Y	A30 : EQ VR : RF GAIN METAL-Y-A A30 : EQ VR : RF GAIN METAL-Y-B	TP100/DM-89
		METAL C	A30 : EQ VR : RF GAIN METAL-C-A A30 : EQ VR : RF GAIN METAL-C-B	TP300/DM-89
		OXIDE C	A30 : EQ VR : RF GAIN OXIDE-C-A A30 : EQ VR : RF GAIN OXIDE-C-B	TP300/DM-89
		OXIDE Y	A30 : EQ VR : RF GAIN OXIDE-Y-A A30 : EQ VR : RF GAIN OXIDE-Y-B	TP100/DM-89
		Data save	A3F : NV-RAM CONTROL	
3-8-5	Cosine equalizer adjustment			
	OMC DC offset		A35 : DM VR 4 : OMC DC METAL-Y	Set the data to E4.
			A35 : DM VR 4 : OMC DC METAL-C A35 : DM VR 4 : OMC DC OXIDE-Y A35 : DM VR 4 : OMC DC OXIDE-C	Set the data to D0.
	METAL Y	Group delay	⊘RV101/DM-89, ⊘RV102/DM-89	TP104/DM-89
		Main	A33 : DM VR 2 : MAIN METAL-Y-A A33 : DM VR 2 : MAIN METAL-Y-B	TP3/DM-89
		Sub	A34 : DM VR 3 : SUB METAL-Y-A A34 : DM VR 3 : SUB METAL-Y-B	NTSC model: Set the data AF. PAL model: TP2/DM-89
	METAL C	Group delay	⊘RV301/DM-89, ⊘RV302/DM-89	TP304/DM-89
		Main	A33 : DM VR 2 : MAIN METAL-C-A A33 : DM VR 2 : MAIN METAL-C-B	TP7/DM-89
		Sub	A34 : DM VR 3 : SUB METAL-C-A A34 : DM VR 3 : SUB METAL-C-B	NTSC model: Set the data 70. PAL model: TP6/DM-89
	OXIDE C	Group delay	⊘RV303/DM-89, ⊘RV304/DM-89	TP304/DM-89
		Main	A33 : DM VR 2 : MAIN OXIDE-C-A A33 : DM VR 2 : MAIN OXIDE-C-B	TP7/DM-89
		Sub	A34 : DM VR 3 : SUB OXIDE-C-A A34 : DM VR 3 : SUB OXIDE-C-B	TP6/DM-89
	OXIDE Y	Group delay	⊘RV104/DM-89, ⊘RV103/DM-89*1	TP104/DM-89
		Main	A33 : DM VR 2 : MAIN OXIDE-Y-A A33 : DM VR 2 : MAIN OXIDE-Y-B	TP3/DM-89
		Sub	A34 : DM VR 3 : SUB OXIDE-Y-A A34 : DM VR 3 : SUB OXIDE-Y-B	TP2/DM-89
	Data save		A3F : NV-RAM CONTROL	
3-8-6	Cosine equalizer provisional adjustment			

Note

This provisional adjustment explains how to adjust without using the network analyzer as opposed to adjustment (Section 3-8-5) using the network analyzer.
Perform this provisional adjustment only when the network analyzer is not available for an urgent maintenance. Be sure to perform the adjustment (Section 3-8-5) using the network analyzer at a later date.

OMC: Over-Modulation Compensation circuit

(Continue)

*1: RV103 is not equipped on the DM-89 board of LOT Nos. 407 and higher.

(Continued)

No.	Item	Adjustment point	Remarks
3-8-7	DM RF output level adjustment		
	METAL Y	⊘RV211/DM-89	TP3/DM-89
	METAL C	⊘RV406/DM-89	TP7/DM-89
	OXIDE C	⊘RV407/DM-89	TP7/DM-89
	OXIDE Y	⊘RV212/DM-89	TP3/DM-89
3-8-8	OMC carrier balance adjustment		
	METAL Y	⊘RV107/DM-89, ⊘RV108/DM-89	TP105/DM-89
	METAL C	⊘RV307/DM-89, ⊘RV308/DM-89	TP305/DM-89
	OXIDE C	⊘RV305/DM-89, ⊘RV306/DM-89	TP305/DM-89
	OXIDE Y	⊘RV105/DM-89, ⊘RV106/DM-89	TP105/DM-89
3-8-9	OMC carrier balance provisional adjustment **Note** This provisional adjustment explains how to adjust without using the spectrum analyzer as opposed to adjustment (Section 3-8-8) using the spectrum analyzer. Perform this provisional adjustment only when the spectrum analyzer is not available for an urgent maintenance. Be sure to perform the adjustment (Section 3-8-8) using the spectrum analyzer at a later date.		
3-8-10	Demodulator limiter balance adjustment		
	Y	⊘RV502/DM-89	TP501/DM-89
	C	⊘RV702/DM-89	TP8/DM-89
3-8-11	Non-liner output level adjustment		
	METAL Y	⊘RV503/DM-89	TP505/DM-89
	METAL C	⊘RV703/DM-89 (For PAL) ⊘RV704/DM-89 (For NTSC)	TP705/DM-89
	OXIDE C	⊘RV704/DM-89 (For PAL only)	TP705/DM-89
	OXIDE Y	⊘RV504/DM-89	TP505/DM-89
3-8-12	PB frequency response adjustment		
	METAL Y	A32 : DM VR 1 : EQ1 METAL-Y-A A32 : DM VR 1 : EQ1 METAL-Y-B	VIDEO OUTPUT COMPONENT Y
	METAL C	A32 : DM VR 1 : EQ1 METAL-C-A A32 : DM VR 1 : EQ1 METAL-C-B	VIDEO OUTPUT COMPONENT R-Y/B-Y
	OXIDE C	A32 : DM VR 1 : EQ1 OXIDE-C-A A32 : DM VR 1 : EQ1 OXIDE-C-B	VIDEO OUTPUT COMPONENT R-Y/B-Y
	OXIDE Y	A32 : DM VR 1 : EQ1 OXIDE-Y-A A32 : DM VR 1 : EQ1 OXIDE-Y-B	VIDEO OUTPUT COMPONENT Y
	Data save	A3F : NV-RAM CONTROL	
3-8-13	Drop-out compensation equalizer adjustment		
	METAL Y	⊘RV201/DM-89	TP203/DM-89
	METAL C	⊘RV401/DM-89	TP403/DM-89
	OXIDE Y	⊘RV202/DM-89	RV202/DM-89
	OXIDE C	⊘RV402/DM-89	RV402/DM-89

(Continue)

(Continued)

No.	Item		Adjustment point	Remarks
3-8-14	DM RF output level readjustment			
		OXIDE C	⊘RV212/DM-89	TP3/DM-89
		METAL Y	⊘RV211/DM-89	TP3/DM-89
		METAL C	⊘RV406/DM-89	TP7/DM-89
		OXIDE Y	⊘RV407/DM-89	TP7/DM-89
3-8-15	RF envelope adjustment			
		TH H level	A36 : DM VR 5 : ENV-TH-H	Set the data to 20.
		TH L level	A36 : DM VR 5 : ENV-TH-L	Set the data to 10.
		Data save	A3F : NV-RAM CONTROL	
		Y	⊘RV205/DM-89	TP203/DM-89
		C	⊘RV405/DM-89	TP403/DM-89
3-8-16	DM search picture adjustment			
		Offset	⊘RV506/DM-89	TP500/DM-89
		Y	⊘RV501/DM-89	TP502/DM-89
		C	⊘RV701/DM-89	TP702/DM-89
		Gain	⊘RV507/DM-89	TP1/DM-89
3-8-17	Guard band width adjustment			
		METAL	A35 : DM VR 4 : GUARD BAND M-YVideo monitor A35 : DM VR 4 : GUARD BAND M-C	
		OXIDE	A35 : DM VR 4 : GUARD BAND O-YVideo monitor A35 : DM VR 4 : GUARD BAND O-C	
		Data save	A3F : NV-RAM CONTROL	
3-8-18	Component output level adjustment			
		METAL Y	⊘RV101/TBC-24	VIDEO OUTPUT COMPONENT Y
		METAL C	⊘RV201/TBC-24	VIDEO OUTPUT COMPONENT R-Y/B-Y
		OXIDE Y	⊘RV504/DM-89	VIDEO OUTPUT COMPONENT Y
3-8-19	A/D clamp DC level adjustment			
		C	⊘RV202/TBC-24*2	TP202/TBC-24
		Y	⊘RV102/TBC-24*2	TP102/TBC-24
3-8-20	VCO lock-in range adjustment			
		Y	⊘RV404/TBC-24*2 ⊘LV401/TBC-24	RV404/TBC-24 TP403/TBC-24
		C	⊘RV604/TBC-24*2 ⊘LV601/TBC-24	RV604/TBC-24 TP603/TBC-24
3-8-21	TBC VCO free-running adjustment*3			
		Y	⊘RV303/TBC-24	RV404/TBC-24 and Video monitor
		C	⊘RV503/TBC-24	Video monitor

(Continue)

*2: RV102, RV202, RV404, and RV604 are not equipped on the TBC-24 board of board number suffixes 13 and higher.

*3: This adjustment is performed only if RV303 on the TBC-24 board was replaced or it was turned by mistake.

(Continued)

No.	Item		Adjustment point	Remarks
3-8-22	FAST VCO tracking adjustment			
		Gain	⊘RV400/TBC-24*4	RV400/TBC-24
		Offset	⊘RV402/TBC-24*5	Video monitor
3-8-23	PB video phase adjustment		⊘RV300/TBC-24 A37 : TBC VR : SQ Y RZ*6	VIDEO OUTPUT COMPONENT Y
3-8-22	TBC Y/C delay rough adjustment			
		METAL	⊘RV502/TBC-24 ⊘RV503/TBC-24 ⊘RV500/TBC-24 A37 : TBC VR : SQ C RZ*7 ⊘RV504/TBC-24*8	VIDEO OUTPUT COMPONENT
3-8-25	Impact error offset adjustment			
		Y	⊘RV401/TBC-24	Video monitor
		C	⊘RV601/TBC-24	Video monitor
3-8-26	TBC Y/C delay adjustment			
		METAL	⊘RV500/TBC-24 ⊘RV504/TBC-24*8	VIDEO OUTPUT COMPONENT
		OXIDE	⊘RV501/TBC-24	VIDEO OUTPUT COMPONENT
3-8-27	VISC phase adjustment		⊘RV200/TBC-23 A37 : TBC VR : VISC PHASE*9	VIDEO OUTPUT COMPONENT Y
		Data save	A3F : NV-RAM CONTROL	

*4: RV400 is not equipped on the TBC-24 board of board number suffixes 14 and higher.
*5: RV402 is not equipped on the TBC-24 board of board number suffixes 14 and higher for PAL.
*6: If the specification is not satisfied by adjusting RV300 on TBC-24 board, change the data of A37 : TBC VR : SQ Y RZ.
*7: If the specification is not satisfied by adjusting RV500 on TBC-24 board, change the data of A37 : TBC VR : SQ C RZ.
*8: RV504 is not equipped on the TBC-24 board of board number suffixes 11, 12, and 13.
*9: If the specification is not satisfied by adjusting RV200 on TBC-23 board, change the data of A37 : TBC VR : VISC PHASE.

3-8-2. Common Preparation

Perform the settings (switches, setup extend menu, etc.) toward the VTR before starting the adjustments.
Return they settings to the customer settings after completing the Betacam / Betacam SP PB system alignment.

1. Reset the all switches on the DM-89 and TBC-23 boards to the factory settings.

   Note

   Before removing the board, wait for more than 30 seconds after turning off the POWER switch.

Board	Ref. No.	Factory setting
DM-86	S101, S102, S301, S302	NOR (right side)
	S501	ON (right side)
	S901	all OFF (down side)
TBC-23	S1, S500	all OFF (down side)

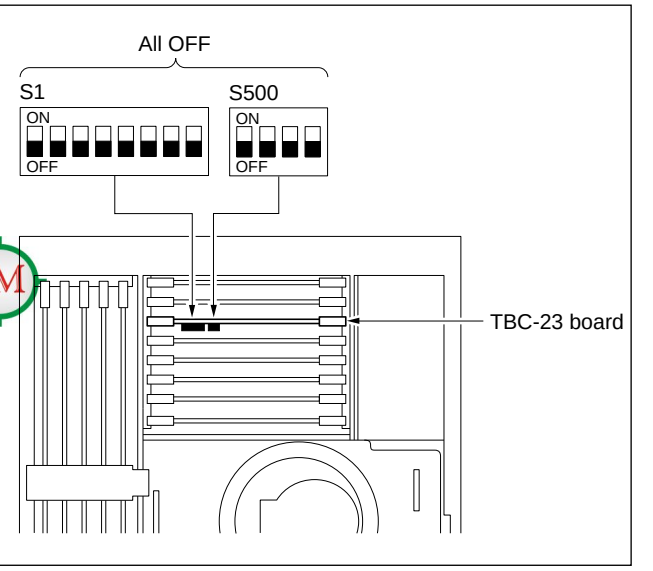
2. Set the VTR's switches as follows:

Location Item	Customer setting	Setting at adjustment
SS-63 board DIP switch S1100-1 (J-1)	_____	⇨ ON (up position)
Note Set to treat the extended menu of the setup menu.		
Sub control panel		
CHARACTER switch	_____	⇨ ON
OUT REF switch	_____	⇨ REF
PROCESS CONTROL switch	_____	⇨ LOCAL
• VIDEO switch	_____	⇨ PRESET
• CHROMA switch	_____	⇨ PRESET
• SET UP switch or BLACK LEVEL switch	_____	⇨ PRESET
• Y/C DELAY switch	_____	⇨ PRESET
• CHROMA PHASE switch	_____	⇨ PRESET
KEY INHIBIT switch	_____	⇨ OFF
CAPSTAN LOCK switch	_____	⇨ 2FD
Upper control panel		
TC (LTC/AUTO/VISC)	_____	⇨ LTC
TC GENERATOR: INT/EXT PRESET/REGEN FREE RUN/REC RUN	 _____ _____ _____	 ⇨ INT ⇨ REGEN ⇨ REC RUN
REMOTE/LOCAL	_____	⇨ LOCAL (unlit 9P)

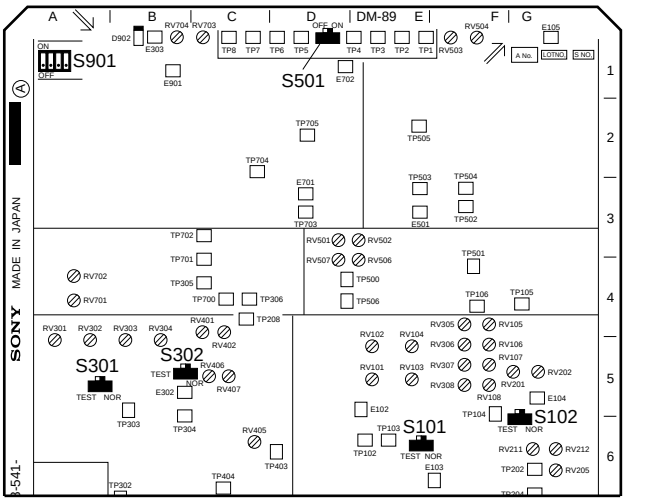
3. For the DNW-A100/A50/A45 only: Set the ITEM-709 and -713 in the setup extended menu as follows:

ITEM No. SUB-ITEM	Customer setting	Setting at adjustment
709 : CAV LEVEL FORMAT		
1. OUTPUT CAV LEVEL	_____	⇨ B-CAM
713 : VIDEO SETUP REFERENCE LEVEL		
0. MASTER LEVEL	_____	⇨ 0.0%
3. BETACAM PB LEVEL	_____	⇨ MSTER
4. OUTPUT LEVEL	_____	⇨ MSTER

4. Insert the cleaning tape, and press the EJECT and PLAY buttons simultaneously.
   - The EJECT button blinks and the PLAY button light. And the cleaning tape is played for about 5 seconds, before it is automatically ejected.



S1 and S500 on TBC-23 Board



DM-89 Board (Side A)

3-8-3. Initial Data Settings

Input the initial data as the adjustment data of the analog Betacam PB system.

Preparing tool

- Analog component video monitor

Note

This video monitor is for menu displaying. Be sure to connect it to VIDEO OUTPUT COMPOSITE 3 (SUPER) connector.

Initial Data Settings

1. To enter the maintenance mode, press S1101(G-1) on the SS-63 board.
2. Enter A3 : BETACAM PB ADJUST in the maintenance mode.
3. Set the following initial data to all items of each submenu.

Item (A3 :BETACAM ADJUST)		Initial data NTSC	PAL
A30 : EQ VR	RF GAIN METAL-Y-A	55	8E
	RF GAIN METAL-Y-B	55	8E
	RF GAIN METAL-C-A	3F	6C
	RF GAIN METAL-C-B	3F	6C
	RF GAIN OXIDE-Y-A	72	9C
	RF GAIN OXIDE-Y-B	72	9C
	RF GAIN OXIDE-C-A	5A	81
	RF GAIN OXIDE-C-B	5A	81
A32 : DM VR 1	EQ1 METAL-Y-A	79	80
	EQ1 METAL-Y-B	79	80
	EQ1 METAL-C-A	7C	90
	EQ1 METAL-C-B	7C	90
	EQ1 OXIDE-Y-A	A6	A1
	EQ1 OXIDE-Y-B	A6	A1
	EQ1 OXIDE-C-A	90	AD
	EQ1 OXIDE-C-B	90	AD
A33 : DM VR 2	MAIN METAL-Y-A	CD	B7
	MAIN METAL-Y-B	CD	B7
	MAIN METAL-C-A	8E	8D
	MAIN METAL-C-B	8E	8D
	MAIN OXIDE-Y-A	A6	A8
	MAIN OXIDE-Y-B	A6	A8
	MAIN OXIDE-C-A	9E	9E
	MAIN OXIDE-C-B	9E	9E
A34 : DM VR 3	SUB METAL-Y-A	AF	B2
	SUB METAL-Y-B	AF	B2
	SUB METAL-C-A	70	91
	SUB METAL-C-B	70	91
	SUB OXIDE-Y-A	B2	BB
	SUB OXIDE-Y-B	B2	BB
	SUB OXIDE-C-A	A7	A8
	SUB OXIDE-C-B	A7	A8
A35 : DM VR 4	GUARD BAND METAL-Y	1D (38*)	27 (29*)
	GUARD BAND METAL-C	1C (21*)	23 (16*)
	GUARD BAND OXIDE-Y	32 (48*)	2F (3B*)
	GUARD BAND OXIDE-C	31 (30*)	29 (16*)
	OMC DC METAL-Y	E4	E4
	OMC DC METAL-C	D0	D0
	OMC DC OXIDE-Y	D0	D0
	OMC DC OXIDE-C	D0	D0
A36 : DM VR 5	DO TH METAL-Y	15	1E
	DO TH METAL-C	14	1D
	DO TH OXIDE-Y	2A	2A
	DO TH OXIDE-C	28	28
	ENV-TH-H	20	20
	ENV-TH-L	10	10
A37 : TBC VR	SQ Y RZ	4C	4B
	SQ C RZ	6F	6E
	VISC PHASE	06	02

*: When the board number suffix of the DM-89 board is 13.

4. Enter A3F : NV-RAM CONTROL, then execute "SAVE ALL ADJUST DATA".
   - Message "Save Complete" is displayed on the video monitor when this data save is completed normally.

   Note

   When loading the previous data without save the current adjusted data, execute "ALL DATA PREVIOUS".
5. To exit A3F : NV-RAM CONTROL, press the MENU button once.

3-8-4. EQ RF Output Level Adjustment

Adjust the EQ RF output level referring to “3-5-3. Betacam / Betacam SP Format PB System (EQ RF Output Level) Adjustment”.

3-8-5. Cosine Equalizer Adjustment

Note

If the network analyzer is not available, perform “3-8-6. Cosine Equalizer Provisional Adjustment”.

Preparing tools

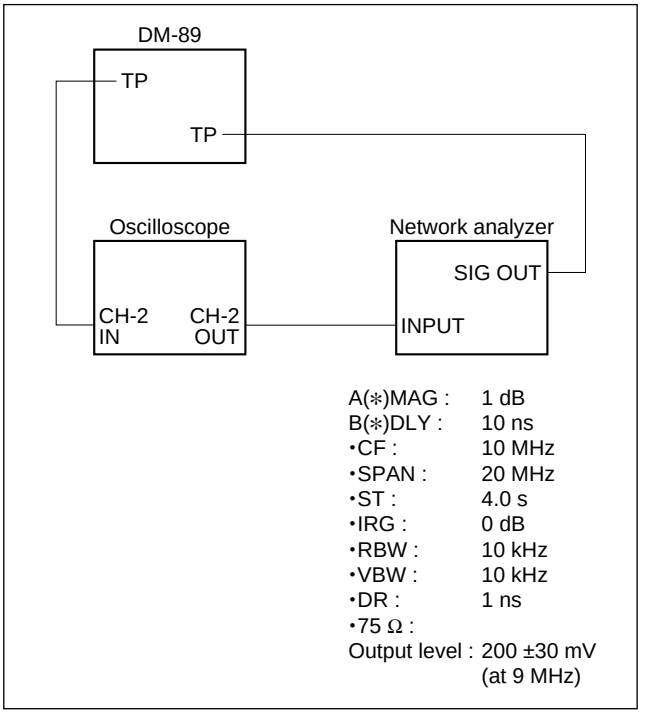
- Oscilloscope: TEKTRONIX 2465B or equivalent
- Network analyzer: ANRITSU MS420B or equivalent
- Analog component video monitor

  Note

  This video monitor is for menu displaying. Be sure to connect it to VIDEO OUTPUT COMPOSITE 3 (SUPER) connector.
- Extension board: EX-377 (Part No. J-6269-810-A)
- Alignment tapes

  For NTSC: CR5-1B (Part No. 8-960-096-41) and
  CR5-2A (Part No. 8-960-097-44)

  For PAL: CR5-1B PS (Part No. 8-960-096-91) and
  CR5-2A PS (Part No. 8-960-098-44)
- Shorting clip



Connection and Setting of Network Analyzer

Preparation of Cosine Equalizer Adjustment

1. Extend the DM-89 board with an extension board EX-377.

Note

Before removing DM-89 board, wait for more than 30 seconds after turning off the POWER switch.

2. Set the following switches on the DM-89 board.

S901-1, -3 (A-1) ⇨ ON
S101(E-6), S301(A-5) ⇨ TEST (left side)

Other switches are the factory setting.
(Refer to step 1 in “3-8-2. Common Preparation”.)

3. Check the setting on the upper control panel.

REMOTE/LOCAL ⇨ LOCAL (unlit 9P)

4. Check the setting on the sub control panel.

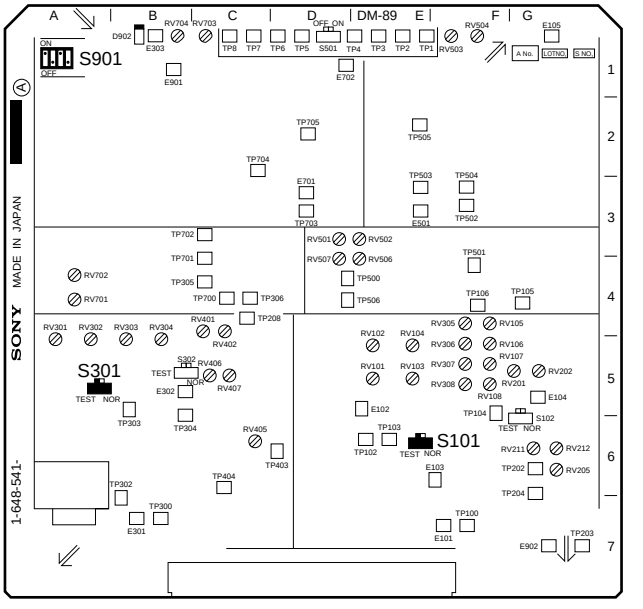
CHARACTER switch ⇨ ON

5. Connect the equipment.

Connect the oscilloscope and network analyzer. (Refer to Figure “Connection and Setting of Network Analyzer”.)

6. Check that the equipment has warmed up.

Before starting the adjustment, warm up the VTR and other equipment through the power for 20 minutes or more.



DM-89 Board (Side A)

1. Check the Initial Data

1. To enter the maintenance mode, press S1101(G-1) on the SS-63 board.
2. Enter A35 : DM VR 4, then check that the data of the following items in A35 : DM VR 4 are the specified data value. (If not, set them to the specified data.) (This is OMC DC offset setting data check.)

Item (A35 : DM VR 4)	Initial data
OMC DC METAL-Y	E4
OMC DC METAL-C	D0
OMC DC OXIDE-Y	D0
OMC DC OXIDE-C	D0

3. To exit A35 : DM VR 4, press the MENU button once.
4. Enter A34 : DM VR 3, then check that the data of the all items in A34 : DM VR 3 are the specified data value. (If not, set them to the specified data.)

Item (A34 : DM VR 3)	Initial data for NTSC	Initial data for PAL
SUB METAL-Y-A	AF	B2
SUB METAL-Y-B	AF	B2
SUB METAL-C-A	70	91
SUB METAL-C-B	70	91
SUB OXIDE-Y-A	B2	BB
SUB OXIDE-Y-B	B2	BB
SUB OXIDE-C-A	A7	A8
SUB OXIDE-C-B	A7	A8

5. To exit A34 : DM VR 3, press the MENU button once.
6. Enter A33 : DM VR 2, then check that the data of the all items in A33 : DM VR 2 are the specified data value. (If not, set them to the specified data.)

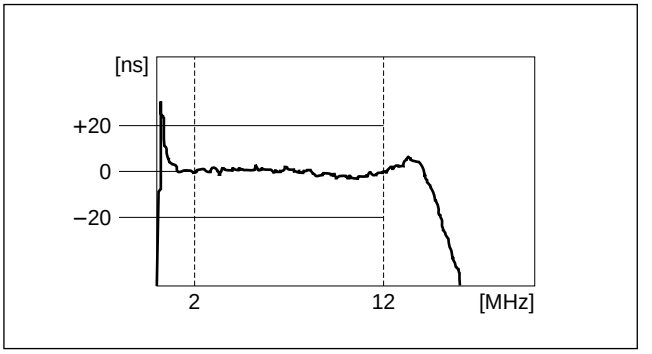
Item (A33 : DM VR 2)	Initial data for NTSC	Initial data for PAL
MAIN METAL-Y-A	CD	B7
MAIN METAL-Y-B	CD	B7
MAIN METAL-C-A	8E	8D
MAIN METAL-C-B	8E	8D
MAIN OXIDE-Y-A	A6	A8
MAIN OXIDE-Y-B	A6	A8
MAIN OXIDE-C-A	9E	9E
MAIN OXIDE-C-B	9E	9E

2. METAL Y Adjustment

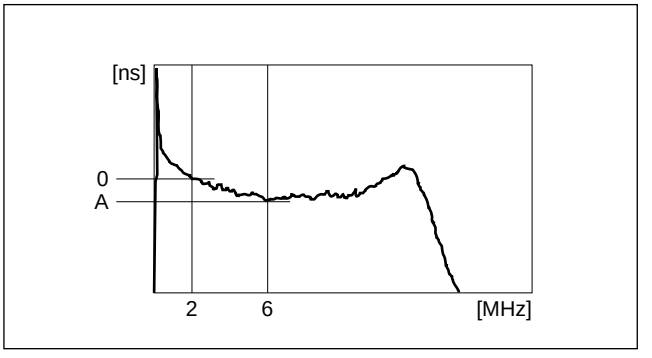
1. Short-circuit TP4/DM-89(E-1) and E702/DM-89(D-1) with a shorting clip.
2. Connect the network analyzer's output to TP103/DM-89(E-6). GND: E103/DM-89(F-6)
3. Insert the following alignment tape in order to set STANDBY OFF mode.
   NTSC model: CR5-1B, PAL model: CR5-1B PS

Group delay adjustment / METAL Y

4. Connect the oscilloscope's CH-2 input to TP104/DM-89 (F-5). GND: E104/DM-89(G-5)
5. Adjust the group delay time in 2 MHz through 12 MHz.
   Adj. points: ⊘RV101/DM-89(E-5) and
   ⊘RV102/DM-89(E-5)
   Specification: 0 ±20 ns



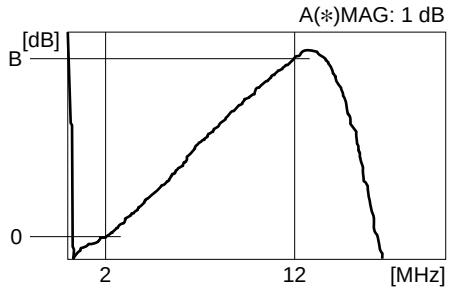
6. For NTSC model only:
   Adjust the delay time at 6 MHz using 2 MHz as the reference.
   Adj. point: ⊘RV101/DM-89(E-5)
   Specification: A = −10 ±3 ns



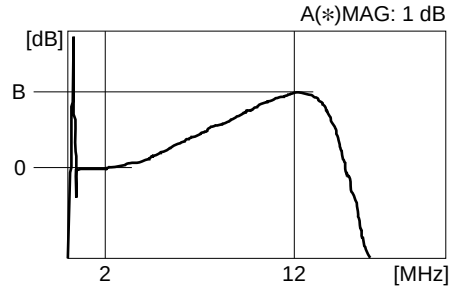
Main adjustment / METAL Y

7. Connect the oscilloscope's CH-2 input to TP3/DM-89 (E-1). GND: E702/DM-89(D-1)
8. Adjust the level at 12 MHz using 2 MHz as the reference.
   Adj. point: A33 : DM VR 2 : MAIN METAL-Y-A
   Specification: NTSC model: B = +8.0 ± 0.5 dB
   PAL model: B = +3.5 ± 0.5 dB

NTSC model



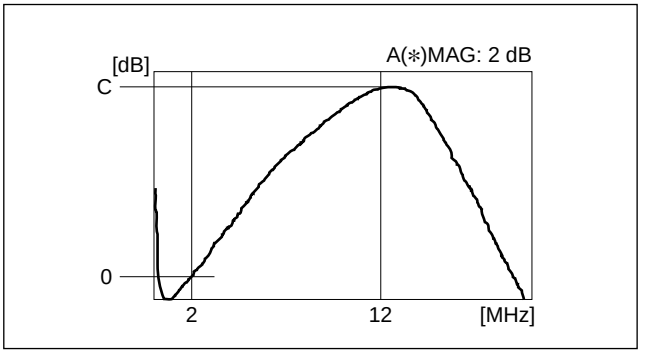
PAL model



9. Set the data of "MAIN METAL-Y-B" in A33 : DM VR 2 to the identical data value as "MAIN METAL-Y-A".
10. To exit A33 : DM VR 2, press the MENU button once.

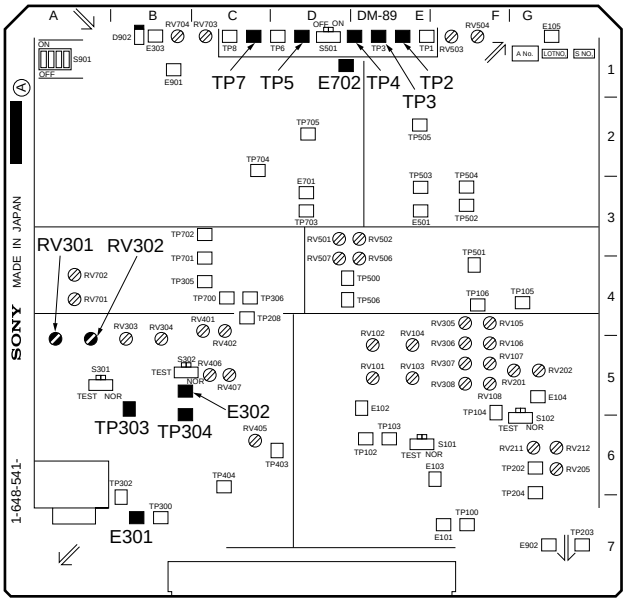
Sub adjustment / METAL Y

11. Enter A34 : DM VR 3.
12. For NTSC model:
    Check that the data of "SUB METAL-Y-A" and "SUB METAL-Y-B" in A34 : DM VR 3 are AF. (If not, set them to AF.)
    For PAL model:
    (1) Connect the oscilloscope's CH-2 input to TP2/DM-89(E-1). GND: E702/DM-89(D-1)
    (2) Adjust the level at 12 MHz using 2 MHz as the reference.
    Adj. point: A34 : DM VR 3 : SUB METAL-Y-A
    Specification: C = +16.5 ± 1.0 dB



    (3) Set the data of "SUB METAL-Y-B" in A34 : DM VR 3 to the identical data value as "SUB METAL-Y-A".

13. To exit A34 : DM VR 3, press the MENU button once.
14. Disconnect the shorting clip from TP4/DM-89(E-1).



DM-89 Board (Side A)

http://getMANUAL.com

3. METAL C Adjustment

1. Short-circuit TP6/DM-89(D-1) and E702/DM-89(D-1) with a shorting clip.
2. Connect the network analyzer's output to TP303/DM-89(B-5). GND: E301/DM-89(B-7)

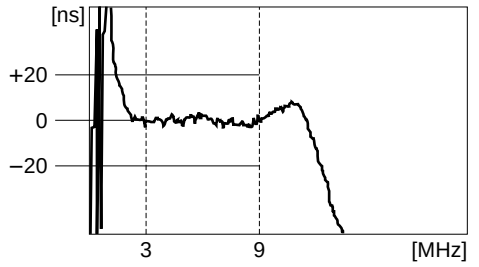
Note

The alignment tape (CR5-1B or CR5-1B PS) is still in the VTR. (STANDBY OFF mode)

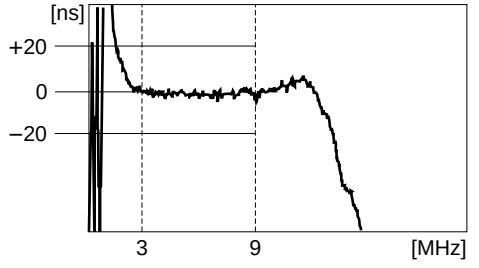
Group delay adjustment / METAL C

3. Connect the oscilloscope's CH-2 input to TP304/DM-89(B-5). GND: E302/DM-89(B-5)
4. Adjust the group delay time in 3 MHz through 9 MHz.
   Adj. points: ⊘RV301/DM-89(A-5) and
   ⊘RV302/DM-89(A-5)
   Specification: 0 ±20 ns

NTSC model



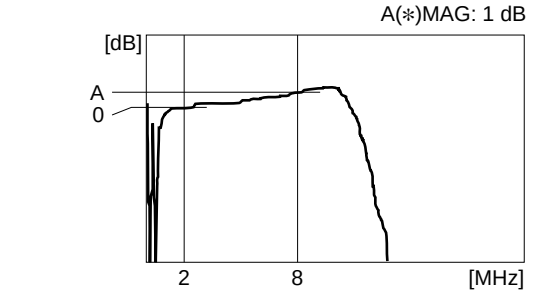
PAL model



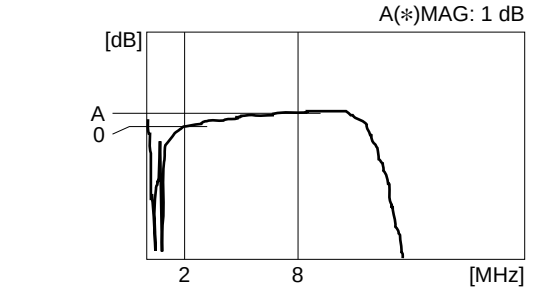
Main adjustment / METAL C

5. Enter A33 : DM VR 2.
6. Connect the oscilloscope's CH-2 input to TP7/DM-89 (C-1). GND: E702/DM-89(D-1)
7. Adjust the level at 8 MHz using 2 MHz as the reference.
   Adj. point: A33 : DM VR 2 : MAIN METAL-C-A
   Specification: B = +0.5 ±0.5 dB

NTSC model



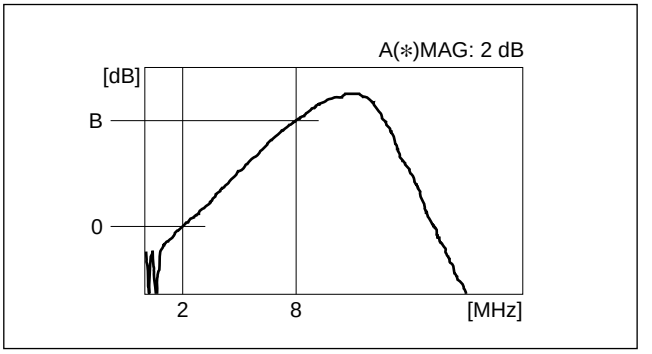
PAL model



8. Set the data of "MAIN METAL-C-B" in A33 : DM VR 2 to the identical data value as "MAIN METAL-C-A".
9. To exit A33 : DM VR 2, press the MENU button once.

Sub adjustment / METAL C

10. Enter A34 : DM VR 3.
11. For NTSC model:
    Check that the data of “SUB METAL-C-A” and “SUB METAL-C-B” in A34 : DM VR 3 are 70. (If not, set them to 70.)
    For PAL model:
    (1) Connect the oscilloscope’s CH-2 input to TP6/DM-89(D-1). GND: E702/DM-89(D-1)
    (2) Adjust the level at 8 MHz using 2 MHz as the reference.
    Adj. point: A34 : DM VR 3 : SUB METAL-C-Y
    Specification: B = +9.2 ± 1.0 dB



    (3) Set the data of “SUB METAL-C-B” in A34 : DM VR 3 to the identical data value as “SUB METAL-C-A”.

12. To perform the tape operation, press the SET button once.
13. Eject the alignment tape.
14. To operate the maintenance mode, press the MENU button once.
15. To exit A34 : DM VR 3, press the MENU button once.

4. OXIDE C Adjustment

1. Insert the following alignment tape in order to set STANDBY OFF mode.
   NTSC model: CR5-2A, PAL model: CR5-2A PS

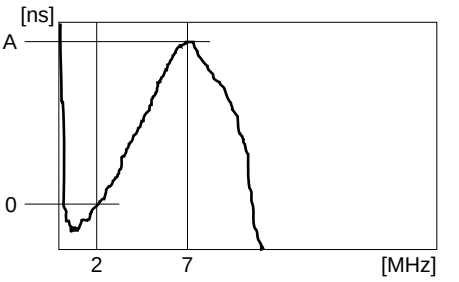
Notes

- Shorting clip is in short circuit between TP5/DM-89 (D-1) and E702/DM-89(D-1).
- The network analyzer’s output is in connection to TP303/DM-89(B-5). GND: E301/DM-89(B-7)

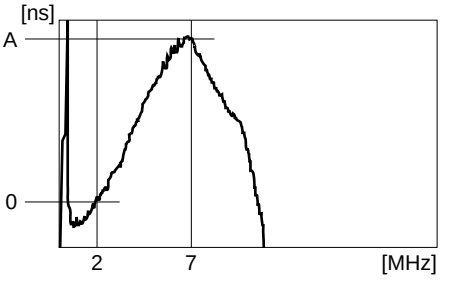
Group delay adjustment / OXIDE C

2. Connect the oscilloscope’s CH-2 input to TP304/DM-89(B-5). GND: E302/DM-89(B-5)
3. Adjust the delay time at 7 MHz using 2 MHz as the reference.
   Adj. points: ◓RV303/DM-89(B-5) and
   ◓RV304/DM-89(B-5)
   Specification: A = 70 ±5 ns

NTSC model



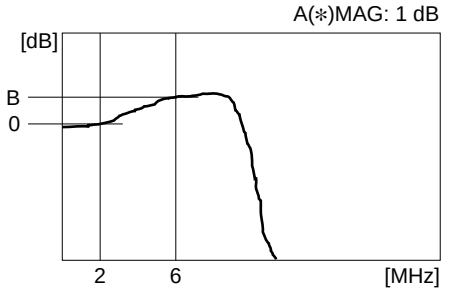
PAL model



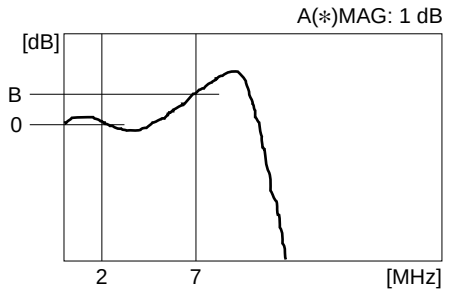
Main adjustment / OXIDE C

4. Enter A33 : DM VR 2.
5. Connect the oscilloscope's CH-2 input to TP7/DM-89 (C-1). GND: E702/DM-89(D-1)
6. Adjust the level at 6 MHz (NTSC) or 7 MHz (PAL) using 2 MHz as the reference.
   Adj. point: A33 : DM VR 2 : MAIN OXIDE-C-A
   Specification: B = +1.2 ±0.5 dB

NTSC model



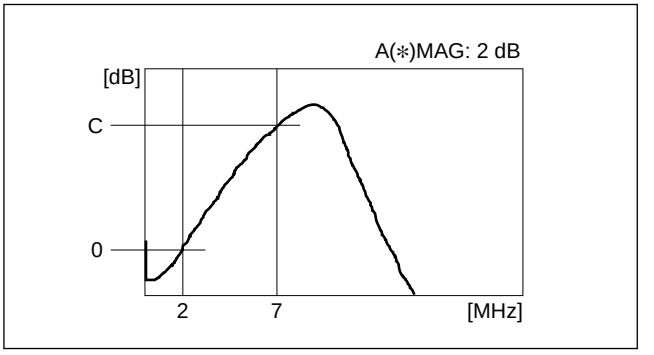
PAL model



7. Set the data of "MAIN OXIDE-C-B" in A33 : DM VR 2 to the identical data value as "MAIN OXIDE-C-A".
8. To exit A33 : DM VR 2, press the MENU button once.

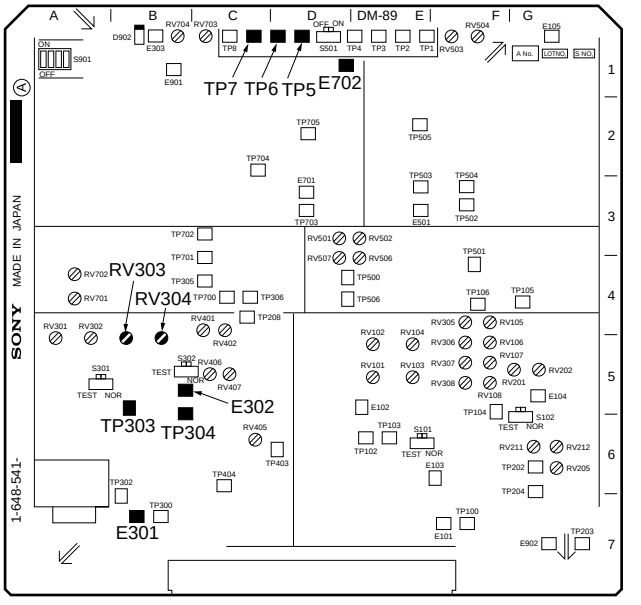
Sub adjustment / OXIDE C

9. Enter A34 : DM VR 3.
10. Connect the oscilloscope's CH-2 input to TP6/DM-89 (D-1). GND: E702/DM-89(D-1)
11. Adjust the level at 7 MHz using 2 MHz as the reference.
    Adj. point: A34 : DM VR 3 : SUB OXIDE-C-A
    Specification: C = +11.0 ±0.5 dB



12. Set the data of "SUB OXIDE-C-B" in A34 : DM VR 3 to the identical data value as "SUB OXIDE-C-A".
13. To exit A34 : DM VR 3, press the MENU button once.

14. Disconnect the shorting clip from TP5/DM-89(D-1).



DM-89 Board (Side A)

5. OXIDE Y Adjustment

1. Short-circuit TP4/DM-89(E-1) and E702/DM-89(D-1) with a shorting clip.
2. When ⊘RV103/DM-89(E-5) is equipped, turn it fully counterclockwise (↺).
3. Connect the network analyzer's output to TP103/DM-89(E-6). GND: E103/DM-89(F-6)

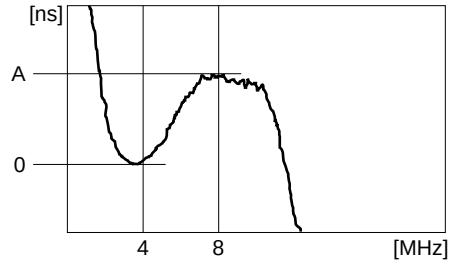
Note

The alignment tape (CR5-2A or CR5-2A PS) is still in the VTR. (STANDBY OFF mode)

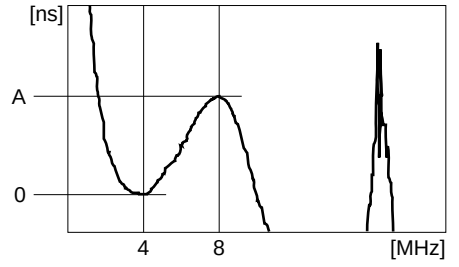
Group delay adjustment / OXIDE Y

4. Connect the oscilloscope's CH-2 input to TP104/DM-89(F-5). GND: E104/DM-89(G-5)
5. Adjust the delay time at 8 MHz using 4 MHz as the reference.
   Adj. point: ⊘RV104/DM-89(E-5)
   Specification: NTSC model: A = 40 ±5 ns
   PAL model: A = 40 ±3 ns

NTSC model



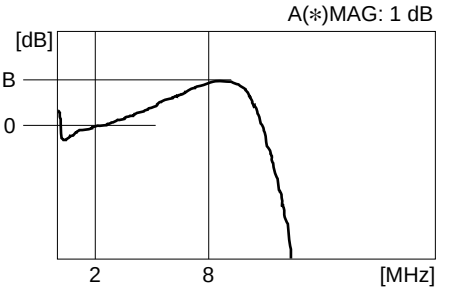
PAL model



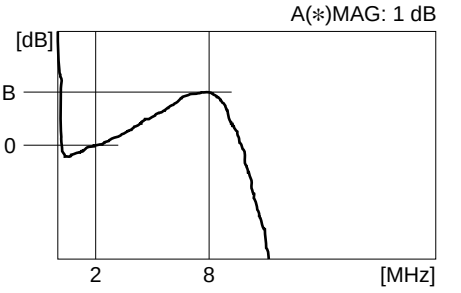
Main adjustment / OXIDE Y

6. Enter A33 : DM VR 2.
7. Connect the oscilloscope's CH-2 input to TP3/DM-89 (E-1). GND: E702/DM-89(D-1)
8. Adjust the level at 8 MHz using 2 MHz as the reference.
   Adj. point: A33 : DM VR 2 : MAIN OXIDE-Y-A
   Specification: NTSC model: B = +2.0 ±0.5 dB
   PAL model: B = +2.5 ±0.5 dB

NTSC model



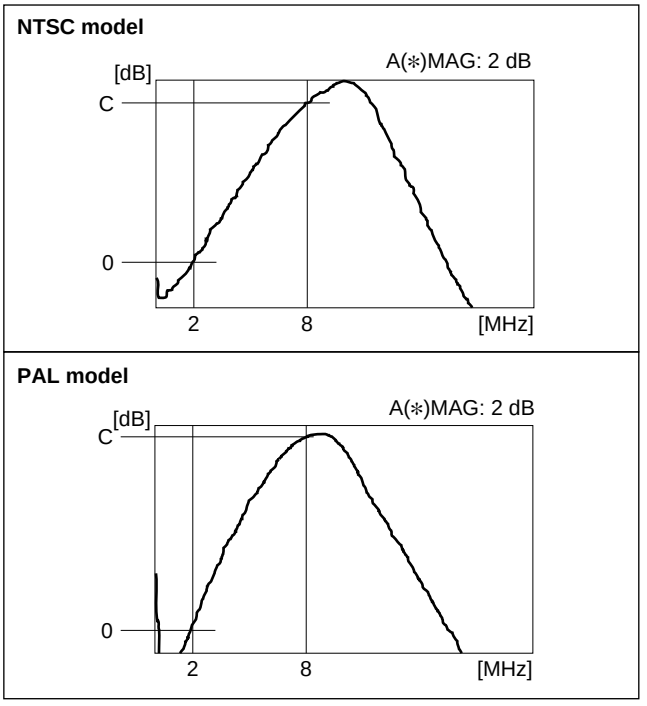
PAL model



9. Set the data of "MAIN OXIDE-Y-B" in A33 : DM VR 2 to the identical data value as "MAIN OXIDE-Y-A".
10. To exit A33 : DM VR 2, press the MENU button once.

Sub adjustment / OXIDE Y

11. Enter A34 : DM VR 3.
12. Connect the oscilloscope's CH-2 input to TP2/DM-89 (E-1). GND: E702/DM-89(D-1)
13. Adjust the level at 8 MHz using 2 MHz as the reference.
    Adj. point: A33 : DM VR 3 : SUB OXIDE-Y-A
    Specification: NTSC model: C = +14.0 ± 0.5 dB
    PAL model: C = +17.0 ± 0.5 dB



14. Set the data of "SUB OXIDE-Y-B" in A34 : DM VR 3 to the identical data value as "SUB OXIDE-Y-A".

15. To perform the tape operation, press the SET button once.
16. Eject the alignment tape.
17. To operate the maintenance mode, press the MENU button once.
18. To exit A34 : DM VR 3, press the MENU button once.

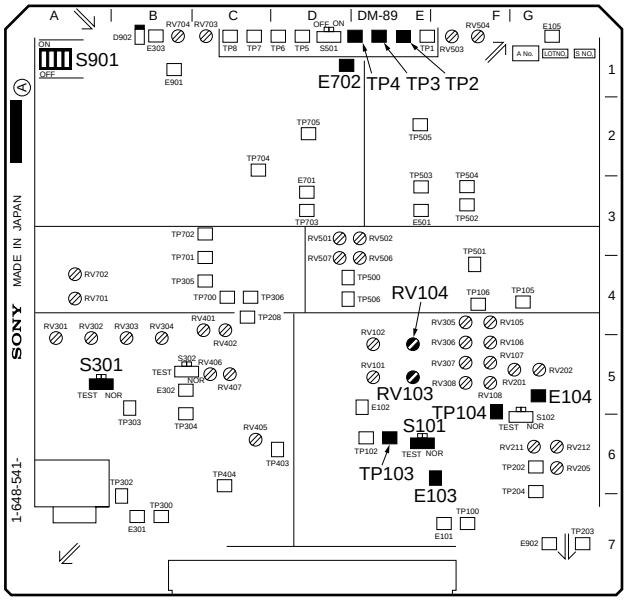
19. Remove the shorting clip between TP4/DM-89(E-1) and E702/DM-89(D-1).
20. Return S101/DM-89(E-6) and S301/DM-89(A-5) to "NOR" side (right side).
21. Return the switches No. 1 and No. 3 of S901/DM-89 (A-1) to OFF (down side).

6. Data Save (Store the Adjusted Data)

1. Enter A3F : NV-RAM CONTROL, then execute "SAVE ALL ADJUST DATA".
   - Message "Save Complete" is displayed on the video monitor when this data save is completed normally.

   Note

   When loading the previous data without save the current adjusted data, execute "ALL DATA PREVIOUS".
2. To exit the maintenance mode, press the MENU button four times.



DM-89 Board (Side A)

3-8-6. Cosine Equalizer Provisional Adjustment

Note

- This provisional adjustment explains how to adjust without using the network analyzer.
  When the performed "3-8-5. Cosine Equalizer Adjustment" using the network analyzer, this provisional adjustment is not necessary to perform.
- Do not perform this provisional adjustment except an urgent maintenance and the network analyzer is not available. If this provisional adjustment is done, it is recommended to perform "3-8-5. Cosine Equalizer Adjustment" using the network analyzer.

Preparing tools

- Analog component video monitor

  Note

  This video monitor is for menu displaying. Be sure to connect it to VIDEO OUTPUT COMPOSITE 3 (SUPER) connector.

Settings of Adjustment Data (Check)

1. To enter the maintenance mode, press S1101(G-1) on the SS-63 board.
2. Check that the data of the following items in A3 : BETACAM ADJUST are the specified data value. (If not, set these items to the specified data.)

(A3 :BETACAM ADJUST) Menu	Item	Setting data NTSC	PAL
A33 : DM VR 2	MAIN METAL-Y-A	CD	B7
	MAIN METAL-Y-B	CD	B7
	MAIN METAL-C-A	8E	8D
	MAIN METAL-C-B	8E	8D
	MAIN OXIDE-Y-A	A6	A8
	MAIN OXIDE-Y-B	A6	A8
	MAIN OXIDE-C-A	9E	9E
	MAIN OXIDE-C-B	9E	9E
A34 : DM VR 3	SUB METAL-Y-A	AF	B2
	SUB METAL-Y-B	AF	B2
	SUB METAL-C-A	70	91
	SUB METAL-C-B	70	91
	SUB OXIDE-Y-A	B2	BB
	SUB OXIDE-Y-B	B2	BB
	SUB OXIDE-C-A	A7	A8
	SUB OXIDE-C-B	A7	A8
A35 : DM VR 4	OMC DC METAL-Y	E4	E4
	OMC DC METAL-C	D0	D0
	OMC DC OXIDE-Y	D0	D0
	OMC DC OXIDE-C	D0	D0

When the data was not changed, skip over to step 4

3. Enter A3F : NV-RAM CONTROL, then execute "SAVE ALL ADJUST DATA".
   - Message "Save Complete" is displayed on the video monitor when this data save is completed normally.

   Note

   When loading the previous data without save the current adjusted data, execute "ALL DATA PREVIOUS".

4. To exit the maintenance mode, press the MENU button four times.

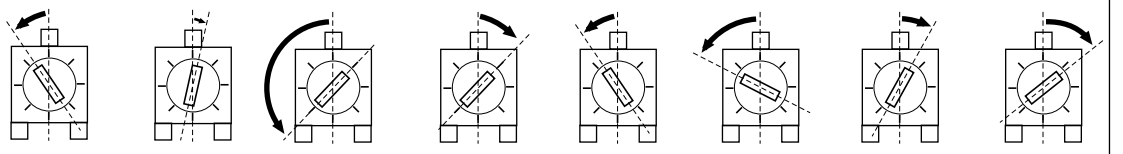
Settings of RVs

Set the following RVs on the DM-89 board to each specified position as shown figure below.

Note

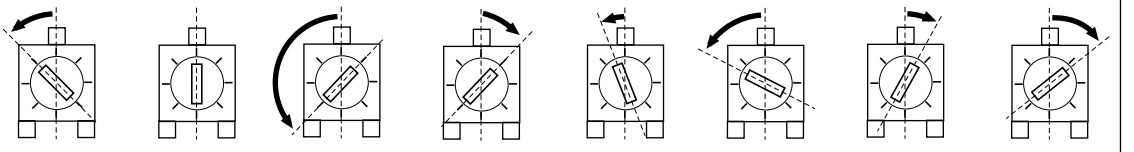
RV103 is not equipped on the DM-89 board of the LOT Nos. 407 and higher.

NTSC model

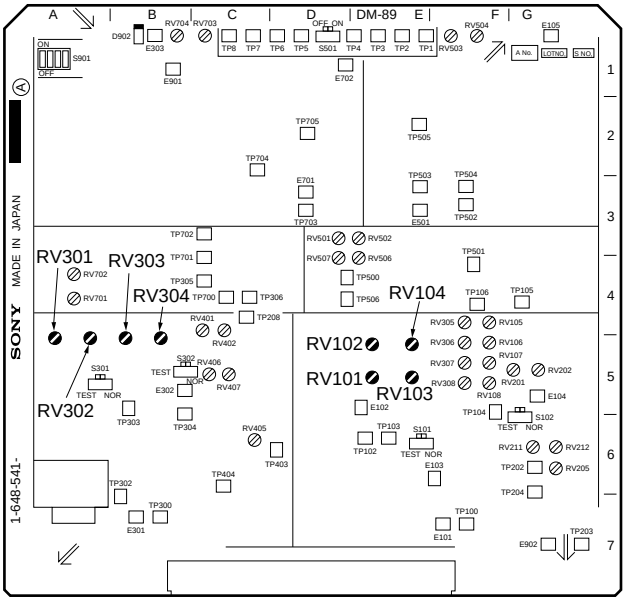


RV101 (E-5) RV102 (E-5) RV103 (E-5) RV104 (E-5) RV301 (A-5) RV302 (A-5) RV303 (B-5) RV304 (B-5)

PAL model



RV101 (E-5) RV102 (E-5) RV103 (E-5) RV104 (E-5) RV301 (A-5) RV302 (A-5) RV303 (B-5) RV304 (B-5)



DM-89 Board (Side A)

3-8-7. DM RF Output Level Adjustment

Preparing tools

- Oscilloscope: TEKTRONIX 2465B or equivalent
- Extension board: EX-377 (Part No. J-6269-810-A)
- Alignment tapes

  For NTSC: CR5-1B (Part No. 8-960-096-41) and
  CR5-2A (Part No. 8-960-097-44)
  For PAL: CR5-1B PS (Part No. 8-960-096-91) and
  CR5-2A PS (Part No. 8-960-098-44)

Preparation

1. Extend the DM-89 board with an extension board EX-377.

Note

Before removing DM-89 board, wait for more than 30 seconds after turning off the POWER switch.

2. Check the switch settings on the DM-89 board.

Reset the switch settings on the DM-89 board to the factory settings. (Refer to step 1 in "3-8-2. Common Preparation".)

3. Check the setting on the upper control panel.

REMOTE/LOCAL ⇨ LOCAL (unlit 9P)

4. Check the setting on the sub control panel.

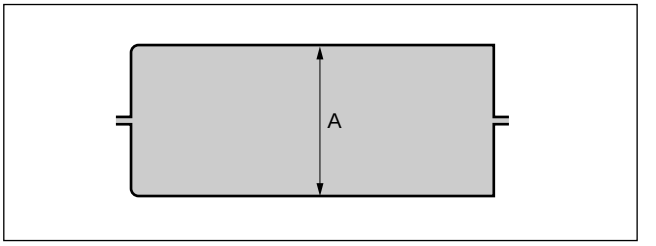
KEY INHIBIT switch ⇨ OFF

5. Check that the equipment has warmed up.

Before starting the adjustment, warm up the VTR and oscilloscope through the power for 20 minutes or more.

1. METAL Y Adjustment

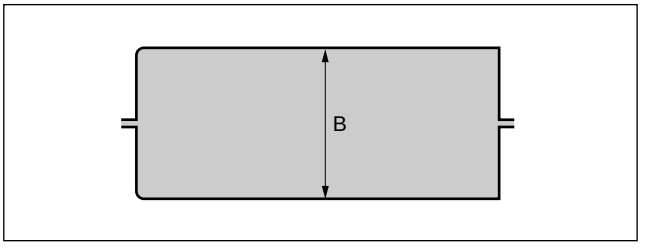
1. Connect and set the oscilloscope as follows:
   CH-1: TP3/DM-89(E-1), AC 100 mV/DIV
   GND: E702/DM-89(D-1)
   CH-2: TP4/DM-89(E-1), DC 1 V/DIV
   GND: E702/DM-89(D-1)
   TIME: 2 ms/DIV
   TRIG: CH-2, – slope
2. During play back the alignment tape in PLAY mode, adjust the level at the middle of V period.
   PB portion: Flat field signal (24:00 to 26:00) of CR5-1B (NTSC) / CR5-1B PS (PAL)
   Adj. point: ◓RV211/DM-89(G-6)
   Specification: A = 400 ± 40 mV p-p



3. Stop the playback of the alignment tape.

2. METAL C Adjustment

1. Change the connection of the oscilloscope as follows:
   CH-1: TP7/DM-89(C-1), GND: E702/DM-89(D-1)
   CH-2: TP5/DM-89(D-1), GND: E702/DM-89(D-1)
2. During play back the alignment tape in PLAY mode, adjust the level at the middle of V period.
   PB portion: Flat field signal (24:00 to 26:00) of CR5-1B (NTSC) / CR5-1B PS (PAL)
   Adj. point: ◓RV406/DM-89(C-5)
   Specification: B = 400 ± 40 mV p-p



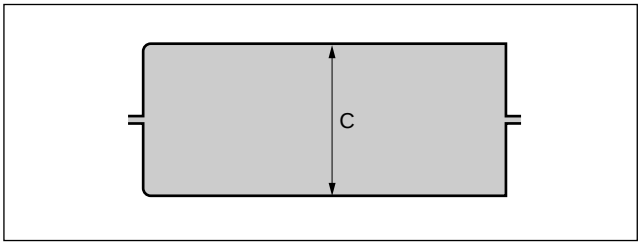
3. Eject the alignment tape.

3. OXIDE C Adjustment

Note

Connection of the oscilloscope remains unchanged.

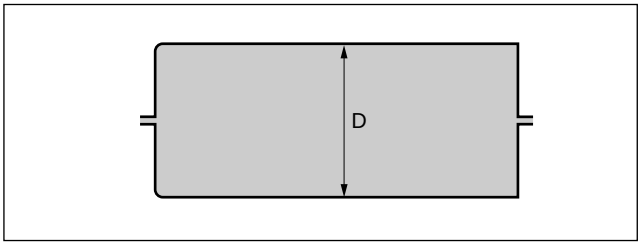
1. During play back the alignment tape in PLAY mode, adjust the level at the middle of V period.
   PB portion: 75% color-bar signal (0:00 to 3:00) of CR5-2A (NTSC) / CR5-2A PS (PAL)
   Adj. point: ⊘RV407/DM-89(C-5)
   Specification: C = 400 ±40 mV p-p



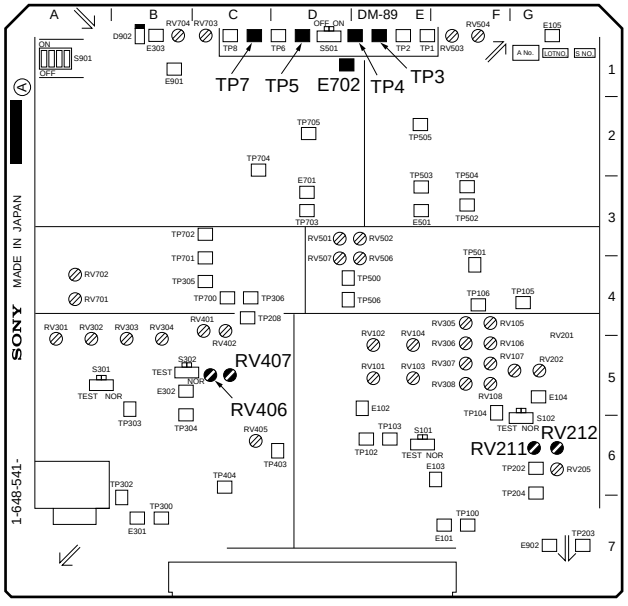
2. Stop the playback of the alignment tape.

4. OXIDE Y Adjustment

1. Change the connection of the oscilloscope as follows:
   CH-1: TP3/DM-89(E-1), GND: E702/DM-89(D-1)
   CH-2: TP4/DM-89(E-1), GND: E702/DM-89(D-1)
2. During play back the alignment tape in PLAY mode, adjust the level at the middle of V period.
   PB portion: 75% color-bar signal (0:00 to 3:00) of CR5-2A (NTSC) / CR5-2A PS (PAL)
   Adj. point: ⊘RV212/DM-89(G-6)
   Specification: D = 400 ±40 mV p-p



3. Stop the playback of the alignment tape.
   Note
   It is not necessary to eject the alignment tape when perform subsequent “3-8-8. OMC Carrier Balance Adjustment”.



DM-89 Board (Side A)

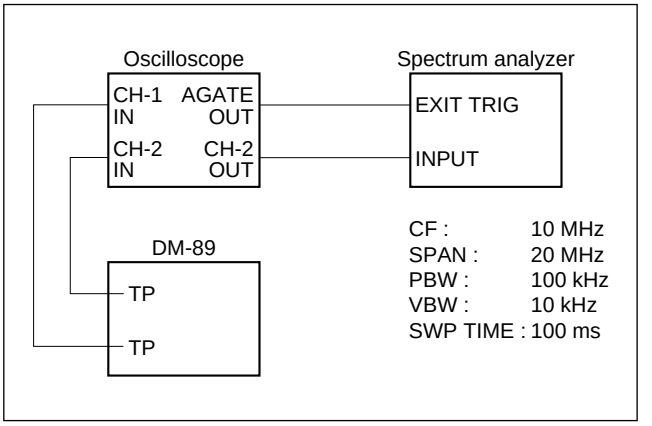
3-8-8. OMC Carrier Balance Adjustment

Note

If the network analyzer is not available, perform "3-8-9. OMC Carrier Balance Provisional Adjustment".

Preparing tools

- Oscilloscope: TEKTRONIX 2465B or equivalent
- Spectrum analyzer:
  ADVANTEST R3261A or equivalent
- Extension board: EX-377 (Part No. J-6269-810-A)
- Alignment tapes
  For NTSC: CR5-1B (Part No. 8-960-096-41) and
  CR5-2A (Part No. 8-960-097-44)
  For PAL: CR5-1B PS (Part No. 8-960-096-91) and
  CR5-2A PS (Part No. 8-960-098-44)
- Shorting clip



Connection and Setting of Spectrum Analyze

Preparation

1. Extend the DM-89 board with an extension board EX-377.

Note

Before removing the board, wait for more than 30 seconds after turning off the POWER switch.

2. Check the switch settings on the DM-89 board.

Reset the switch settings on the DM-89 board to the factory settings. (Refer to step 1 in "3-8-2. Common Preparation".)

3. Check the setting on the upper control panel.

REMOTE/LOCAL ⇨ LOCAL (unlit 9P)

4. Check the setting on the sub control panel.

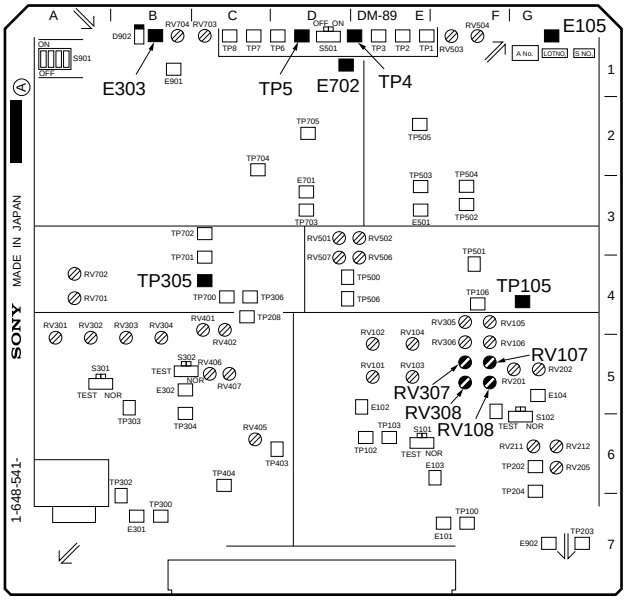
KEY INHIBIT switch ⇨ OFF

5. Connect the equipment.

Connect the oscilloscope and spectrum analyzer. (Refer to Figure "Connection and Setting of Spectrum Analyzer".)

6. Check that the equipment has warmed up.

Before starting the adjustment, warm up the VTR and other equipment through the power for 20 minutes or more.

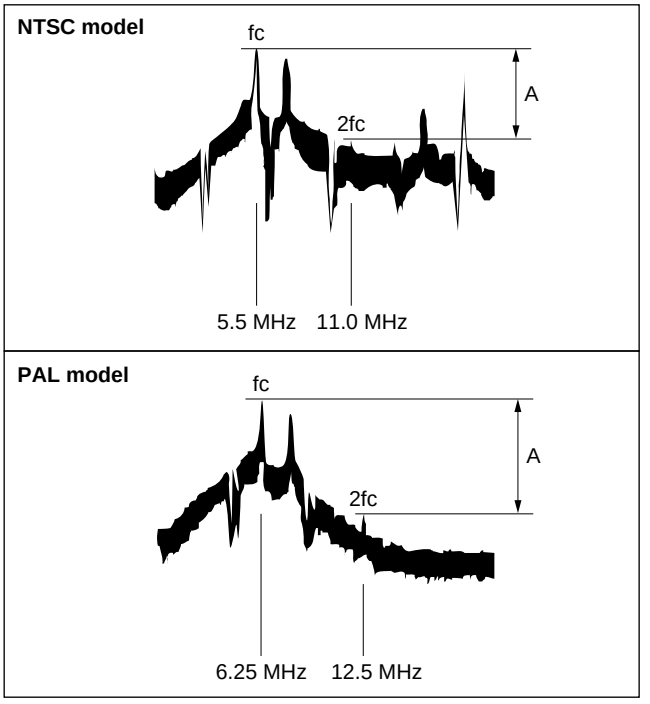


DM-89 Board (Side A)

http://getMANUAL.com

1. OXIDE Y Adjustment

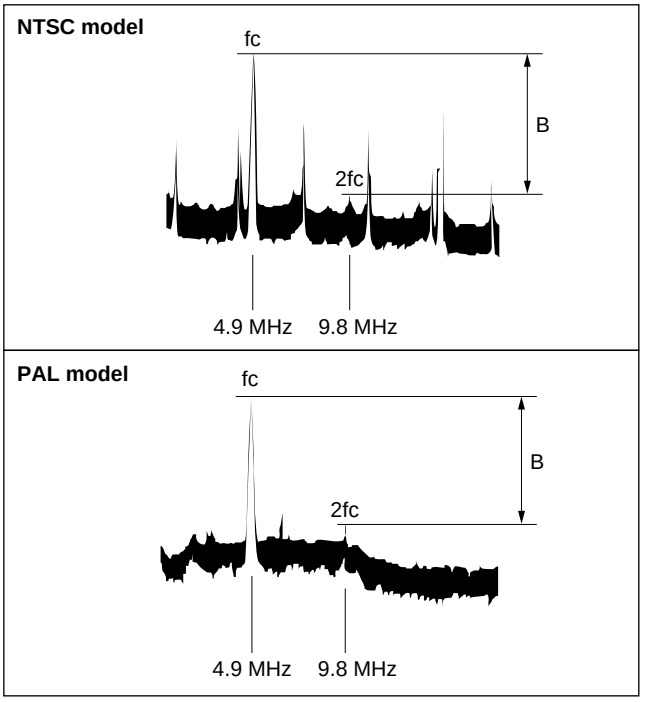
1. Connect and set the oscilloscope as follows:
   CH-1: TP4/DM-89(E-1), DC 1 V/DIV
   GND: E702/DM-89(D-1)
   CH-2: TP105/DM-89(G-4), AC 1 V/DIV
   GND: E105/DM-89(G-1)
   TIME: 5 ms/DIV
   TRIG: CH-1, – slope
2. During play back the alignment tape in PLAY mode, adjust the level difference between the fc and 2fc on the spectrum analyzer.
   PB portion: Pulse & bar signal (9:00 to 11:00) of CR5-2A (NTSC)/ CR5-2A PS (PAL)
   Adj. points: ⊘RV107/DM-89(F-5) and ⊘RV108/DM-89(F-5)
   Specification: A ≧ 35 dB



3. Stop the playback of the alignment tape.

2. OXIDE C Adjustment

1. Change the connection of the oscilloscope as follows:
   CH-1: TP5/DM-89(D-1), GND: E702/DM-89(D-1)
   CH-2: TP305/DM-89(C-4), GND: E303/DM-89(B-1)
2. During play back the alignment tape in PLAY mode, adjust the level difference between the fc and 2fc on the spectrum analyzer.
   PB portion: Pulse & bar signal (9:00 to 11:00) of CR5-2A (NTSC)/ CR5-2A PS (PAL)
   Adj. points: ⊘RV307/DM-89(F-5) and ⊘RV308/DM-89(F-5)
   Specification: B ≧ 35 dB



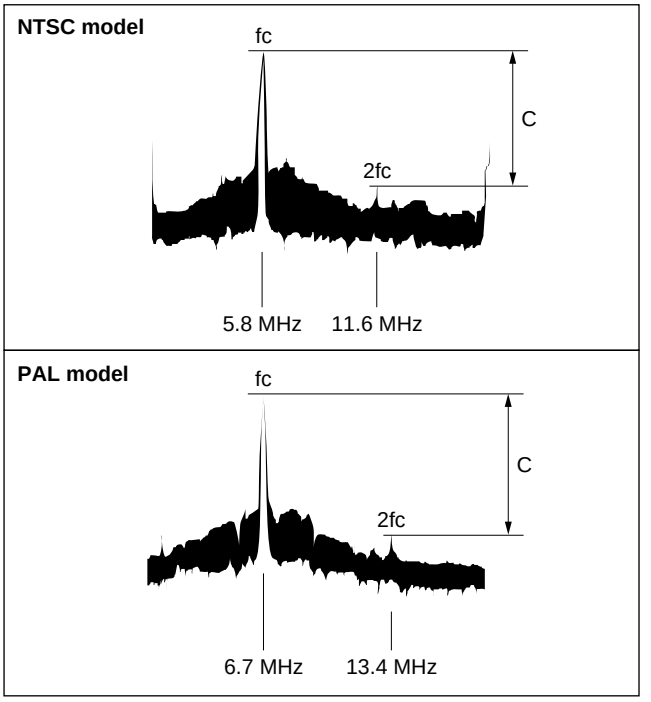
3. Eject the alignment tape.

3. METAL C Adjustment

Note

Connection of the oscilloscope remains unchanged.

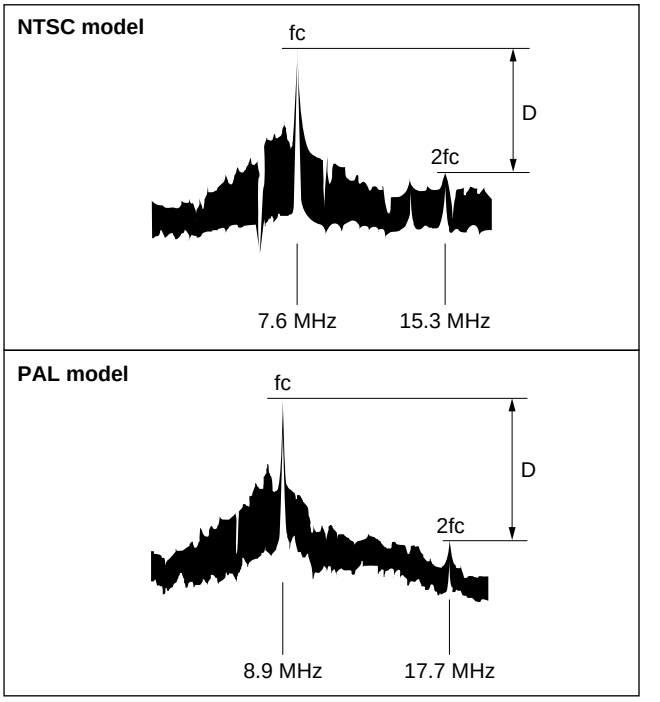
1. During play back the alignment tape in PLAY mode, adjust the level difference between the fc and 2fc on the spectrum analyzer.
   PB portion: Flat field signal (24:00 to 26:00) of CR5-1B (NTSC) / CR5-1B PS (PAL)
   Adj. points: ⊘RV305/DM-89(F-4) and ⊘RV306/DM-89(F-5)
   Specification: C ≧ 40 dB



2. Stop the playback of the alignment tape.

4. METAL Y Adjustment

1. Change the connection of the oscilloscope as follows:
   CH-1: TP4/DM-89(E-1), GND: E702/DM-89(D-1)
   CH-2: TP105/DM-89(G-4), GND: E105/DM-89(G-1)
2. During play back the alignment tape in PLAY mode, adjust the level difference between the fc and 2fc on the spectrum analyzer.
   PB portion: Flat field signal (24:00 to 26:00) of CR5-1B (NTSC) / CR5-1B PS (PAL)
   Adj. points: ⊘RV105/DM-89(F-4) and ⊘RV106/DM-89(F-5)
   Specification: D ≧ 40 dB



3. Stop the playback of the alignment tape.

Note

It is not necessary to eject the alignment tape when perform subsequent “3-8-10. Demodulator Limiter Balance Adjustment”.

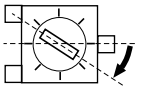
3-8-9. OMC Carrier Balance Provisional Adjustment

Notes

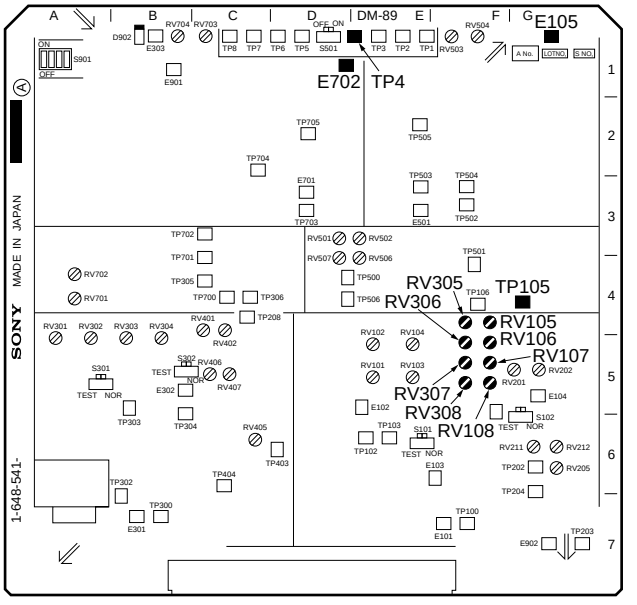
- This provisional adjustment explains how to adjust without using the spectrum analyzer.
  When the performed “3-8-8. OMC Carrier Balance Adjustment” using the spectrum analyzer, this provisional adjustment is not required.
- Perform this provisional adjustment only when the spectrum analyzer is not available for an urgent maintenance. At a later date, be sure to perform “3-8-8. OMC Carrier Balance Adjustment” using the spectrum analyzer.

Settings of RVs

Set the following RVs on the DM-89 board to specified position respectively as shown below.



RV105 (F-4)
RV106 (F-5)
RV107 (F-5)
RV108 (F-5)
RV305 (F-4)
RV306 (F-5)
RV307 (F-5)
RV308 (F-5)



DM-89 Board (Side A)

3-8-10. Demodulator Limiter Balance Adjustment

Note

For the Y adjustment:
When the spectrum analyzer is not available for an urgent maintenance, omit steps 2 through 4 in the Y adjustment. If step 1 is done only, be sure to perform the steps 2 through 4 in the Y adjustment at a later date.

Preparing tools

- Oscilloscope: TEKTRONIX 2465B or equivalent
- Spectrum analyzer:
  ADVANTEST R3261A or equivalent
- Extension board: EX-377 (Part No. J-6269-810-A)
- Alignment tapes
  For NTSC: CR5-1B (Part No. 8-960-096-41)
  For PAL: CR5-1B PS (Part No. 8-960-096-91)

Preparation

1. Extend the DM-89 board with an extension board EX-377.

Note

Before removing DM-89 board, wait for more than 30 seconds after turning off the POWER switch.

2. Check the switch settings on the DM-89 board.

Reset the switch settings on the DM-89 board to the factory settings. (Refer to step 1 in "3-8-2. Common Preparation".)

3. Check the setting on the upper control panel.

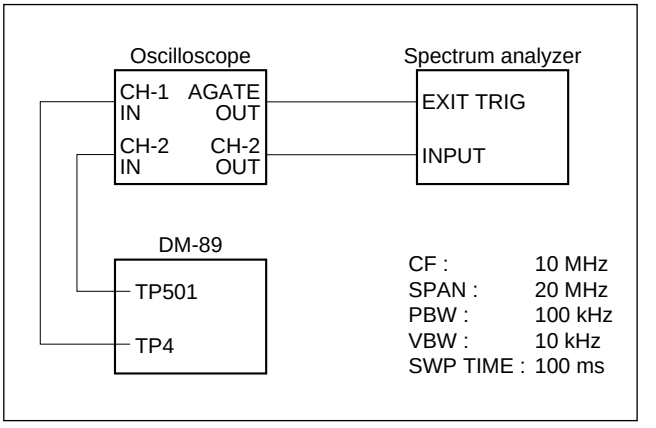
REMOTE/LOCAL ⇨ LOCAL (unlit 9P)

4. Check the setting on the sub control panel.

KEY INHIBIT switch ⇨ OFF

5. Connect the equipment.

Connect the oscilloscope and spectrum analyzer. (Refer to Figure "Connection and Setting of Spectrum Analyzer".)



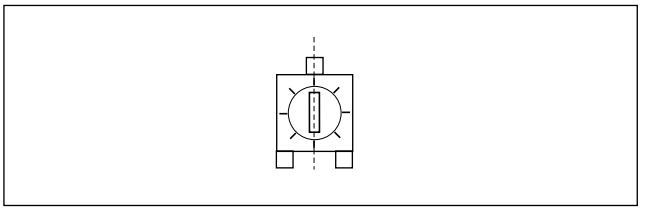
Connection and Setting of the Spectrum Analyzer

6. Check that the equipment has warmed up.

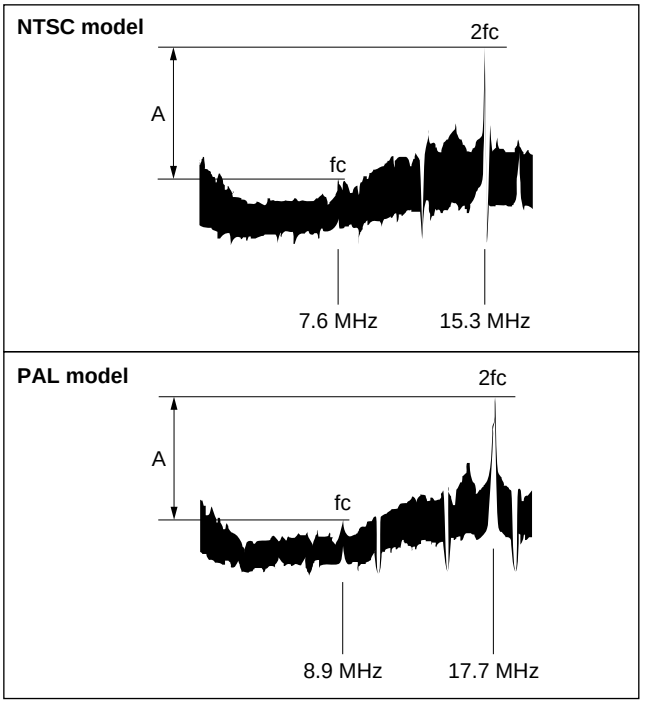
Before starting the adjustment, warm up the VTR and other equipment through the power for 20 minutes or more.

1. Y Adjustment

1. Set RV502/DM-89(E-3) to the specified position as shown figure below.



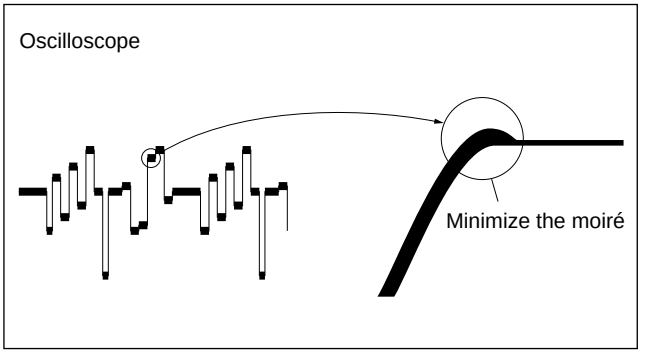
2. Connect and set the oscilloscope as follows:
   CH-1: TP4/DM-89(E-1), DC 1 V/DIV
   GND: E702/DM-89(D-1)
   CH-2: TP501/DM-89(F-4), AC 1 V/DIV
   GND: E501/DM-89(E-3)
   TIME: 5 ms/DIV
   TRIG: CH-1, – slope
2. During play back the alignment tape in PLAY mode, adjust the level difference between the fc and 2fc on the spectrum analyzer.
   PB portion: Flat field signal (24:00 to 26:00) of CR5-1B (NTSC) / CR5-1B PS (PAL)
   Adj. point: ⊘RV502/DM-89(E-3)
   Specification: Maximize the level difference A. (Minimize the fc.)



4. Stop the playback of the alignment tape.

2. C Adjustment

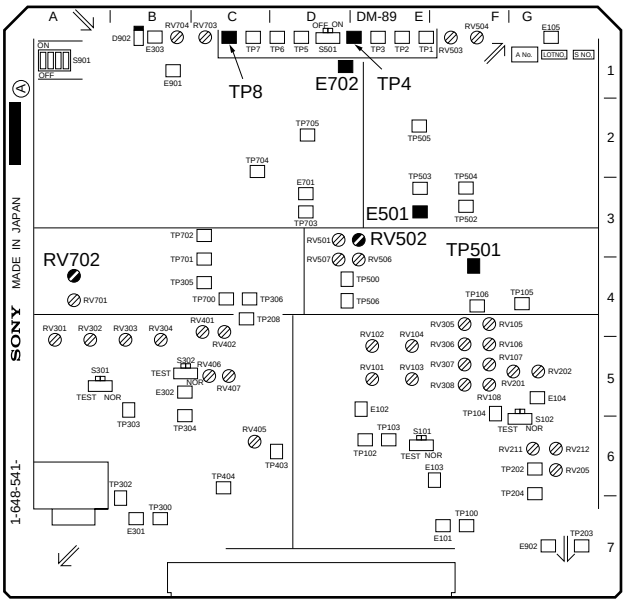
1. Connect and set the oscilloscope as follows:
   CH-1: TP8/DM-89(C-1), AC 200 mV/DIV
   GND: E702/DM-89(D-1)
   TIME: 10 µs/DIV
2. During play back the alignment tape in PLAY mode, adjust the moiré of specified part on the oscilloscope.
   PB portion: Flat filed signal (24:00 to 26:00) of CR5-1B (NTSC) / CR5-1B PS (PAL)
   Adj. point: ⊘RV702/DM-89(A-4)
   Specification: Minimize the moiré of specified part.



3. Stop the playback of the alignment tape.

Note

It is not necessary to eject the alignment tape when perform subsequent "3-8-11. Non-Liner Output Level Adjustment".



DM-89 Board (Side A)

3-8-11. Non-Liner Output Level Adjustment

Preparing tools

- Oscilloscope: TEKTRONIX 2465B or equivalent
- Extension board: EX-377 (Part No. J-6269-810-A)
- Alignment tapes

For NTSC: CR5-1B (Part No. 8-960-096-41) and
CR5-2A (Part No. 8-960-097-44)
For PAL: CR5-1B PS (Part No. 8-960-096-91) and
CR5-2A PS (Part No. 8-960-098-44)

Preparation

1. Extend the DM-89 board with an extension board EX-377.

Note

Before removing DM-89 board, wait for more than 30 seconds after turning off the POWER switch.

2. Check the switch settings on the DM-89 board.

Reset the switch settings on the DM-89 board to the factory settings. (Refer to step 1 in "3-8-2. Common Preparation".)

3. Check the setting on the upper control panel.

REMOTE/LOCAL ⇨ LOCAL (unlit 9P)

4. Check the setting on the sub control panel.

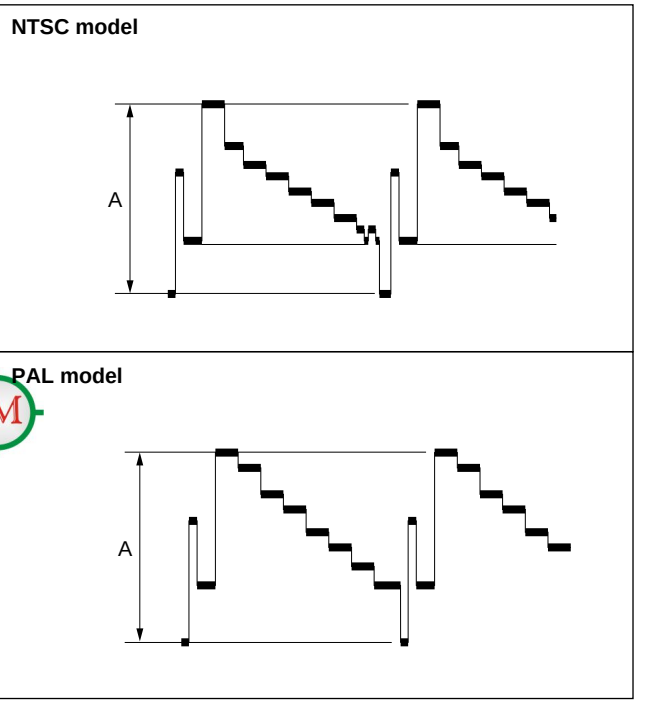
KEY INHIBIT switch ⇨ OFF

5. Check that the equipment has warmed up.

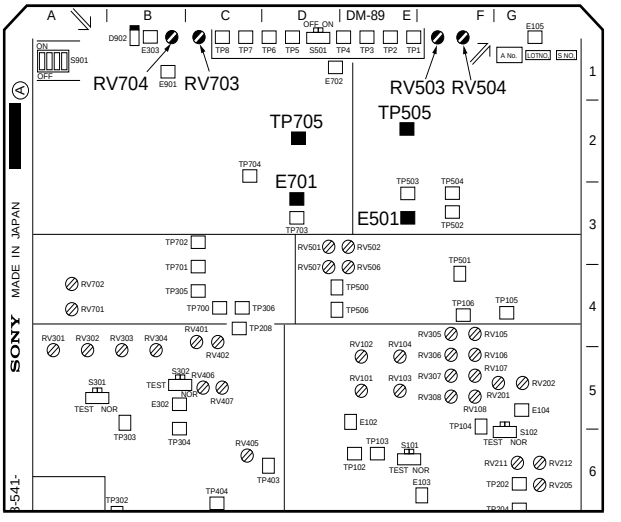
Before starting the adjustment, warm up the VTR and oscilloscope through the power for 20 minutes or more.

1. METAL Y Adjustment

1. Connect and set the oscilloscope as follows:
   CH-1: TP505/DM-89(E-2), AC 200 mV/DIV
   GND: E501/DM-89(E-3)
   TIME: 10 µs/DIV
2. During play back the alignment tape in PLAY mode, adjust the level of specified part on the oscilloscope.
   PB portion: Color-bar signal (14:00 to 17:00) of CR5-1B (NTSC) / CR5-1B PS (PAL)
   Adj. point: ◓RV503/DM-89(F-1)
   Specification: A = 1.00 ± 0.01 V



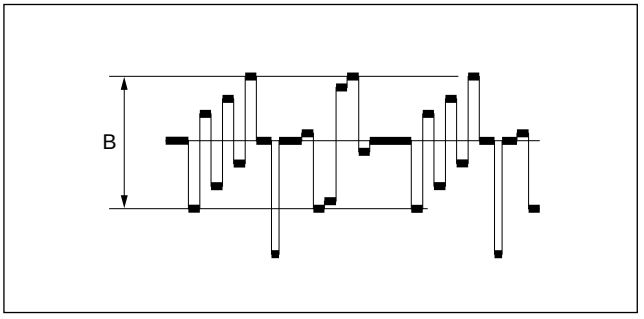
3. Stop the playback of the alignment tape.



DM-89 Board (Side A)

2. METAL C Adjustment for PAL Model Only

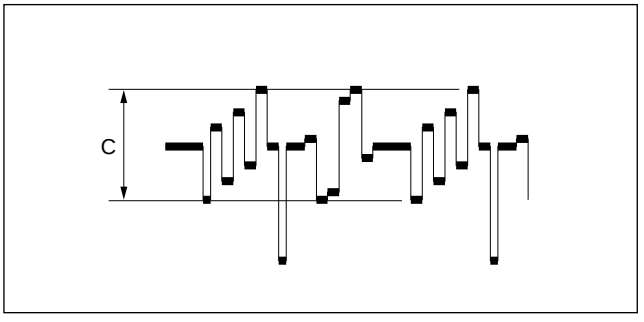
1. Change the connection of the oscilloscope as follows:
   CH-1: TP705/DM-89(D-2), GND: E701/DM-89(D-3)
2. During play back the alignment tape in PLAY mode, adjust the level of specified part on the oscilloscope.
   PB portion: 100% color-bar signal (14:00 to 17:00) of CR5-1B PS
   Adj. point: ⊘RV703/DM-89(C-1)
   Specification: B = 933 ±10 mV



3. Eject the alignment tape.

4. C (NTSC) / OXIDE C (PAL) Adjustment

1. For NTSC model only:
   Change the connection of the oscilloscope as follows:
   CH-1: TP705/DM-89(D-2), GND: E701/DM-89(D-3)
2. During play back the alignment tape in PLAY mode, adjust the level of specified part on the oscilloscope.
   PB portion: 75% color-bar signal
   NTSC: 14:00 to 17:00 in CR5-1B
   PAL: 0:00 to 3:00 in CR5-2A PS
   Adj. point: ⊘RV704/DM-89(B-1)
   Specification: C = 700 ±10 mV

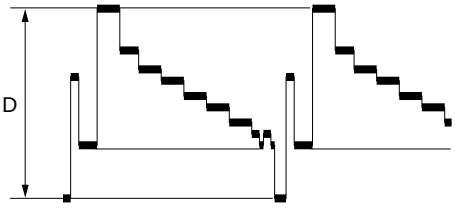


3. Stop the playback of the alignment tape.
4. For NTSC model only: Eject the alignment tape.

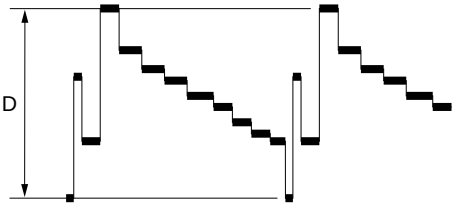
3. OXIDE Y Adjustment

1. Change the connection of the oscilloscope as follows:
   CH-1: TP505/DM-89(E-2), GND: E501/DM-89(E-3)
2. During play back the alignment tape in PLAY mode, adjust the level of specified part on the oscilloscope.
   PB portion: 75% color-bar signal (0:00 to 3:00) of CR5-2A (NTSC) / CR5-2A PS (PAL)
   Adj. point: ⊘RV504/DM-89(F-1)
   Specification: D = 1.00 ±0.01 V

NTSC model



PAL model



3. Eject the alignment tape.

3-8-12. PB Frequency Response Adjustment

Preparing tools

- Analog composite video signal generator
  For NTSC: TEKTRONIX TSG-170A or equivalent
  For PAL: TEKTRONIX TSG-271 or equivalent
- Analog component waveform monitor:
  TEKTRONIX WFM300 or equivalent
- Analog component video monitor

  Note

  This video monitor is for menu displaying.
- Extension board: EX-377 (Part No. J-6269-810-A)
- Alignment tapes
  For NTSC: CR5-1B (Part No. 8-960-096-41) and
  CR5-2A (Part No. 8-960-097-44)
  For PAL: CR5-1B PS (Part No. 8-960-096-91) and
  CR5-2A PS (Part No. 8-960-098-44)
- 75 Ω terminators (4 pieces)

Preparation

1. Extend the DM-89 board with an extension board EX-377.

Note

Before removing DM-89 board, wait for more than 30 seconds after turning off the POWER switch.

2. Check the switch setting on the SS-63 board.

S1100-1 (J-1) ⇨ ON

3. Check the switch settings on the DM-89 and TBC-23 boards.

Reset the switch settings on the DM-89 and TBC-23 boards to the factory settings. (Refer to step 1 in “3-8-2. Common Preparation”.)

4. Check the setting on the upper control panel.

REMOTE/LOCAL ⇨ LOCAL (unlit 9P)

5. Check the settings on the sub control panel.

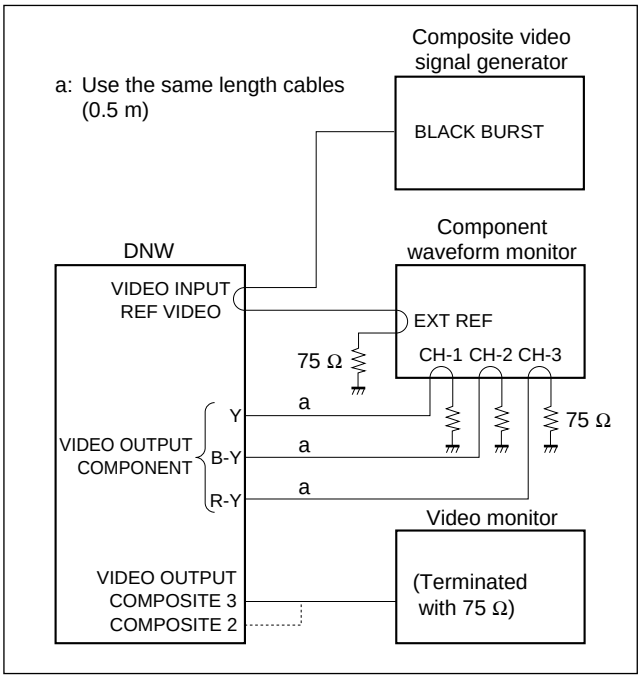
CHARACTER switch ⇨ ON
KEY INHIBIT switch ⇨ OFF

6. Check the setup extend menu settings. (NTSC model only)

ITEM-709: CAV LEVEL FORMAT
  1. OUTPUT CAV LEVEL ⇨ B-CAM
ITEM-713: VIDEO SETUP REFERENCE LEVEL
  0. MASTER LEVEL ⇨ 0.0%
  3. BETACAM PB LEVEL ⇨ MSTER
  4. OUTPUT LEVEL ⇨ MSTER

7. Connect the equipment.

(Refer to Figure “Connection”.)



Connection

8. Check that the equipment has warmed up.

Before starting the adjustment, warm up the VTR and other equipment through the power for 20 minutes or more.

1. Check the Initial Data

1. To enter the maintenance mode, press S1101(G-1) on the SS-63 board.
2. Enter A32 : DM VR 1, then check that the data of all items in A32 : DM VR 1 are the specified data value. (If not, set them to the specified data.)

Item (A32 : DM VR 1)	Initial data for NTSC model	Initial data for PAL model
EQ1 METAL-Y-A	79	80
EQ1 METAL-Y-B	79	80
EQ1 METAL-C-A	7C	90
EQ1 METAL-C-B	7C	90
EQ1 OXIDE-Y-A	A6	A1
EQ1 OXIDE-Y-B	A6	A1
EQ1 OXIDE-C-A	90	AD
EQ1 OXIDE-C-B	90	AD

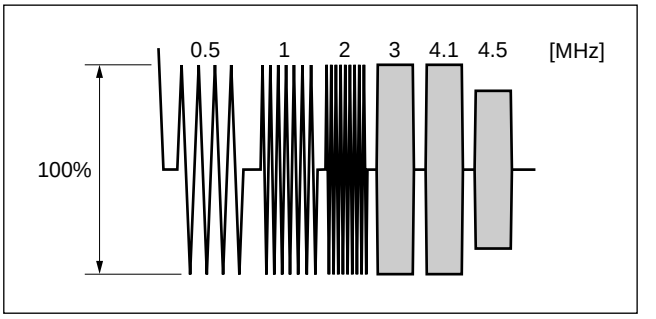
3. To perform the tape operation, press the SET button once.

2. METAL Y Adjustment

1. Watch the Y output signal on the analog component waveform monitor.
   Note
   As the Y output is overlapped the outputs of A channel and B channel on the component waveform monitor, adjust/check the level at each channel.
2. During play back the alignment tape in PLAY mode, measure level at 0.5 MHz (NTSC) / 2T BAR (PAL).
   PB portion: Multi-burst signal (8:00 to 11:00) of CR5-1B (NTSC) / CR5-1B PS (PAL)
   This measured level is reference level 100% (0 dB).
3. Restart the playback of alignment tape from the top of PB portion in PLAY mode.
   PB portion: The same as step 2
4. To operate the maintenance mode, press the MENU button once.
5. Adjust the level at 4.1 MHz (NTSC) / 5 MHz (PAL).
   PB portion: The same as step 2
   Adj. points:
   A channel: A32 : DM VR 1 : EQ1 METAL-Y-A
   B channel: A32 : DM VR 1 : EQ1 METAL-Y-B
   Specification (A and B channels):
   See the table below.
6. To perform the tape operation, press the SET button once.
7. During play back the alignment tape in PLAY mode, check each level at the other frequency parts.
   PB portion: The same as step 2
   Specification (A and B channels):
   See the table below.
8. Connect the video monitor to VIDEO OUTPUT COMPOSITE 2 connector.
9. During play back the alignment tape in PLAY mode, check the playback picture on the video monitor.
   PB portion: The same as step 2
   Specification: It has not flicker.
10. Reconnect the video monitor to VIDEO OUTPUT COMPOSITE 3 (SUPER) connector.

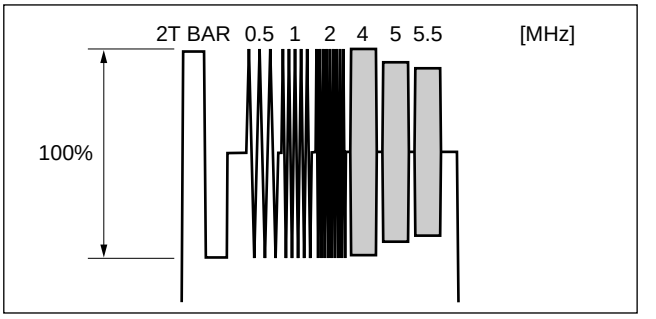
Specifications for NTSC model

Frequency	Specification for NTSC model (Level at 0.5 MHz is 100% {0 dB}.)
4.1 MHz	Adjust: 94% (100 to 90%) {$-0.5\ ^{+0.5}_{-0.4}$ dB}
1 MHz 2 MHz 3 MHz	Check: 100% (106 to 63%) {$0\ ^{+0.5}_{-4.0}$ dB}
4.5 MHz	Check: 80% (106 to 63%) {$-2.0\ ^{+2.5}_{-2.0}$ dB}



Specifications for PAL model

Frequency	Specification for PAL model (Level at 2T BAR is 100% {0 dB}.)
5 MHz	Adjust: 91% (96 to 87%) {−0.8 ±0.4 dB}
0.5 MHz 1 MHz 2 MHz 4 MHz	Check: 100% (106 to 63%) {$0\ ^{+0.5}_{-4.0}$ dB}
5.5 MHz	Check: 84% (106 to 63%) {$-1.5\ ^{+2.0}_{-2.5}$ dB}



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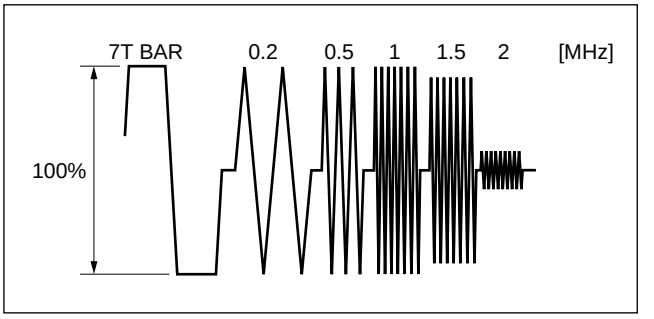
3. METAL C Adjustment

1. Watch the R-Y output signal on the analog component waveform monitor.
   Note
   As the R-Y(B-Y) output is overlapped the outputs of A channel and B channel on the component waveform monitor, adjust/check the level at each channel.
2. During play back the alignment tape in PLAY mode, measure level at 7T BAR (NTSC) / 8T BAR (PAL).
   PB portion: Multi-burst signal (8:00 to 11:00) of CR5-1B (NTSC) / CR5-1B PS (PAL)
   This measured level is reference level 100% (0 dB).
3. Restart the playback of alignment tape from the top of PB portion in PLAY mode.
   PB portion: The same as step 2
4. To operate the maintenance mode, press the MENU button once.
5. Adjust the level at 1 MHz (NTSC) / 1.5 MHz (PAL).
   PB portion: The same as step 2
   Adj. points:
   A channel: A32 : DM VR 1 : EQ1 METAL-C-A
   B channel: A32 : DM VR 1 : EQ1 METAL-C-B
   Specifications (A and B channels):
   See the table below.
6. To perform the tape operation, press the SET button once.
7. During play back the alignment tape in PLAY mode, check each level at the other frequency parts.
   PB portion: The same as step 2
   Specifications (A and B channels):
   See the table below.
8. Watch the B-Y output signal on the component waveform monitor.
9. Check that the B-Y output signal levels at every frequencies are within specifications shown below. If the B-Y output signal is out of specifications, perform fine adjustment for R-Y until the specifications for R-Y and B-Y output signals.
10. Eject the alignment tape.

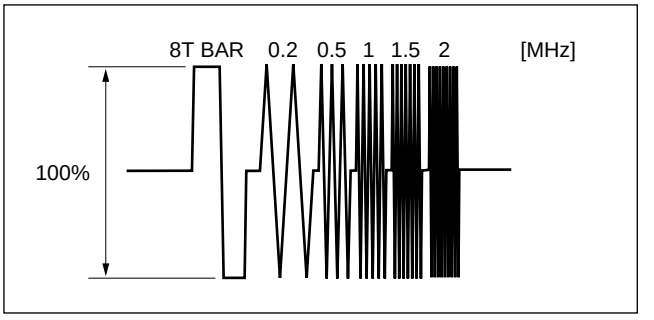
Specifications for NTSC model

Frequency	Specification for NTSC model (Level at 0.5 MHz is 100% {0 dB}.)	
1 MHz	Adjust: 94% (100 to 89%)	{−0.5 ±0.5 dB}
0.2 MHz 0.5 MHz	Check: 100% (106 to 63%)	{0 $^{+0.5}_{-3.0}$ dB}
1.5 MHz	Check: 80% (106 to 71%)	{−2.0 $^{+2.5}_{-1.0}$ dB}



Specifications for PAL model

Frequency	Specification for PAL model (Level at 8T BAR is 100% {0 dB}.)	
1.5 MHz	Adjust: 93% (102 to 85%)	{−0.6 ±0.8 dB}
0.2 MHz 0.5 MHz 1 MHz	Check: 100% (106 to 71%)	{0 $^{+0.5}_{-3.0}$ dB}
2 MHz	Check: 80% (106 to 71%)	{−2.0 $^{+2.5}_{-1.0}$ dB}



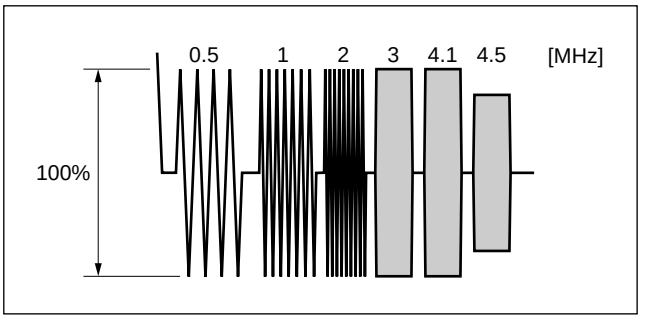
4. OXIDE Y Adjustment

1. Watch the Y output signal on the analog component waveform monitor.
   Note
   As the Y output is overlapped the outputs of A channel and B channel on the component waveform monitor, adjust/check the level at each channel.
2. During play back the alignment tape in PLAY mode, measure level at 0.5 MHz (NTSC) / 2T BAR (PAL).
   PB portion: Multi-burst signal (3:00 to 6:00) of CR5-2A (NTSC) / CR5-2A PS (PAL)
   This measured level is reference level 100% (0 dB).
3. Restart the playback of alignment tape from the top of PB portion in PLAY mode.
   PB portion: The same as step 2
4. To operate the maintenance mode, press the MENU button once.
5. Adjust the level at 2 MHz (NTSC) / 3 MHz (PAL).
   PB portion: The same as step 2
   Adj. points:
   A channel: A32 : DM VR 1 : EQ1 OXIDE-Y-A
   B channel: A32 : DM VR 1 : EQ1 OXIDE-Y-B
   Specifications (A and B channels):
   See the table below.
6. To perform the tape operation, press the SET button once.
7. During play back the alignment tape in PLAY mode, check each level at the other frequency parts.
   PB portion: The same as step 2
   Specifications (A and B channels):
   See the table below.
8. During play back the alignment tape in PLAY mode, check the output level difference between A and B channels at high frequency (4.5 MHz) part.
   PB portion: The same as step 2
   Specification: It is not noticeable.
   Note
   If the output level difference of A and B channels at 4.5 MHz part is noticeable, change the data of "SUB OXIDE-Y-A" or "SUB OXIDE-Y-B" in A34 : DM VR 3 as following steps (1) to (8).

(1) To operate the maintenance mode, press the MENU button once.
(2) To exit A32 : DM VR 1, press the MENU button once.
(3) Enter A34 : DM VR 3.
(4) Change the data of "SUB OXIDE-Y-A" (A channel side), and judge a lower level channel.

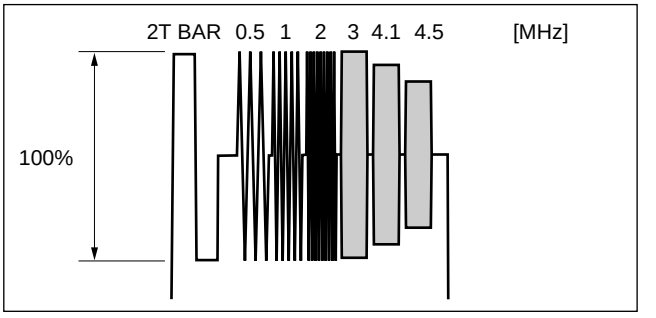
Specifications for NTSC model

Frequency	Specification for NTSC model (Level at 0.5 MHz is 100% {0 dB}.)
2 MHz	Adjust: 100% (104 to 95%) {0 $^{+0.3}_{-0.4}$ dB}
1 MHz	Check: 100% (106 to 50%) {0 $^{+0.5}_{-6.0}$ dB}
3 MHz	Check: 89% (106 to 50%) {−1.0 $^{+1.5}_{-5.0}$ dB}
4.1 MHz	Check: 71% (106 to 50%) {−3.0 $^{+3.5}_{-3.0}$ dB}



Specifications for PAL model

Frequency	Specification for PAL model (Level at 2T BAR is 100% {0 dB}.)
3 MHz	Adjust: 89% (100 to 79%) {−1.0 ±1.0 dB}
0.5 MHz 1 MHz, 2 MHz	Check: 100% (106 to 50%) {0 $^{+0.5}_{-6.0}$ dB}
4.1 MHz	Check: 71% (106 to 50%) {−3.0 $^{+3.5}_{-3.0}$ dB}



(5) If the B channel side is lower: Return the data of "SUB OXIDE-Y-A" to the former data, then adjust (add to the data value) "SUB OXIDE-Y-B" until the level at 4.5 MHz of B channel is equal to the level at 4.5 MHz of A channel.
If the A channel side is lower: Adjust (add to the data value) "SUB OXIDE-Y-A" until the level at 4.5 MHz of A channel is equal to the level at 4.5 MHz of B channel.
(6) To exit A34 : DM VR 3, press the MENU button once.
(7) Enter A32 : DM VR 1.
(8) To perform the tape operation, press the SET button

5. OXIDE C Adjustment

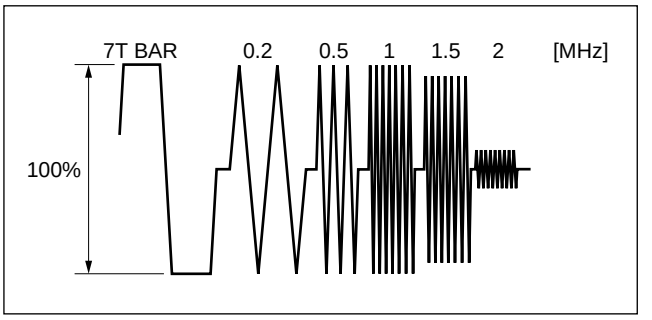
1. Watch the R-Y output signal at the analog component waveform monitor.

   Note

   As the R-Y (B-Y) output is overlapped the outputs of A channel and B channel on the component waveform monitor, adjust/check the level at each channel.
2. During play back the alignment tape in PLAY mode, measure level at 7T BAR (NTSC) / 8T BAR (PAL).
   PB portion: Multi-burst signal (3:00 to 6:00) of CR5-2A (NTSC) / CR5-2A PS (PAL)
   This measured level is reference level 100% (0 dB).
3. Restart the playback of alignment tape from the top of PB portion in PLAY mode.
   PB portion: The same as step 2
4. To operate the maintenance mode, press the MENU button once.
5. Adjust the level at 1 MHz.
   PB portion: The same as step 2
   Adj. points:
   A channel: A32 : DM VR 1 : EQ1 OXIDE-C-A
   B channel: A32 : DM VR 1 : EQ1 OXIDE-C-B
   Specifications (A and B channels):
   See the table below.
6. To perform the tape operation, press the SET button once.
7. During play back the alignment tape in PLAY mode, check each level at the other frequency parts.
   PB portion: The same as step 2
   Specifications (A and B channels):
   See the table below.
8. Watch the B-Y output signal on the component waveform monitor.
9. Check that the B-Y output signal levels at every frequencies are within specifications shown below. If the B-Y output signal is out of specifications, perform fine adjustment for R-Y until the specifications for R-Y and B-Y output signals.
10. Eject the alignment tape.
11. To operate the maintenance mode, press the MENU button once.
12. To exit A32 : DM VR 1, press the MENU button once.

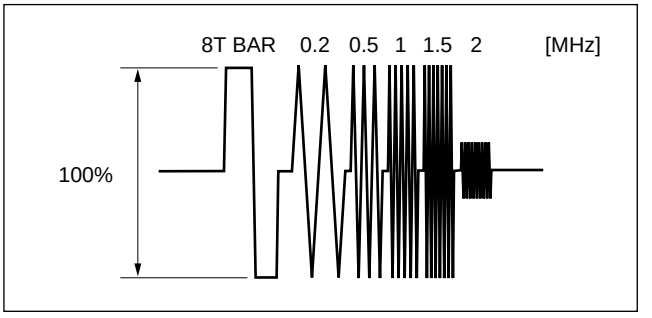
Specifications for NTSC model

Frequency	Specification for NTSC model (Level at 0.5 MHz is 100% {0 dB}.)	
1 MHz	Adjust: 94% (100 to 89%)	{–0.5 ±0.5 dB}
0.2 MHz	Check: 100% (106 to 71%)	{0 $^{+0.5}_{-3.0}$ dB}
0.5 MHz	Check: 95% (106 to 71%)	{–0.4 $^{+0.9}_{-2.6}$ dB}
1.5 MHz	Check: 80% (106 to 71%)	{–2.0 $^{+2.5}_{-1.0}$ dB}



Specifications for PAL model

Frequency	Specification for PAL model (level at 8T BAR is 100% {0 dB}.)	
1 MHz	Adjust: 94% (102 to 86%)	{–0.5 ±0.8 dB}
0.2 MHz 0.5 MHz	Check: 100% (106 to 71%)	{0 $^{+0.5}_{-3.0}$ dB}
1.5 MHz	Check: 84% (106 to 71%)	{–1.5 $^{+2.0}_{-1.5}$ dB}



6. Data Save (Store the Adjusted Data)

1. Enter A3F : NV-RAM CONTROL, then execute "SAVE ALL ADJUST DATA".
   • Message "Save Complete" is displayed on the video monitor when this data save is completed normally.

   Note

   When loading the previous data without save the current adjusted data, execute "ALL DATA PREVIOUS".
2. To exit the maintenance mode, press the MENU button four times.

3-8-13. Drop-out Compensation Equalizer Adjustment

Preparing tools

- Oscilloscope: TEKTRONIX 2465B or equivalent
- Extension board: EX-377 (Part No. J-6269-810-A)
- Alignment tape
  For NTSC: CR5-1B (Part No. 8-960-096-41)
  For PAL: CR5-1B PS (Part No. 8-960-096-91)

Preparation

1. Extend the DM-89 board with an extension board EX-377.

Note

Before removing DM-89 board, wait for more than 30 seconds after turning off the POWER switch.

2. Check the switch settings on the DM-89 board.

Reset the switch settings on the DM-89 board to the factory settings. (Refer to step 1 in "3-8-2. Common Preparation".)

3. Check the setting on the upper control panel.

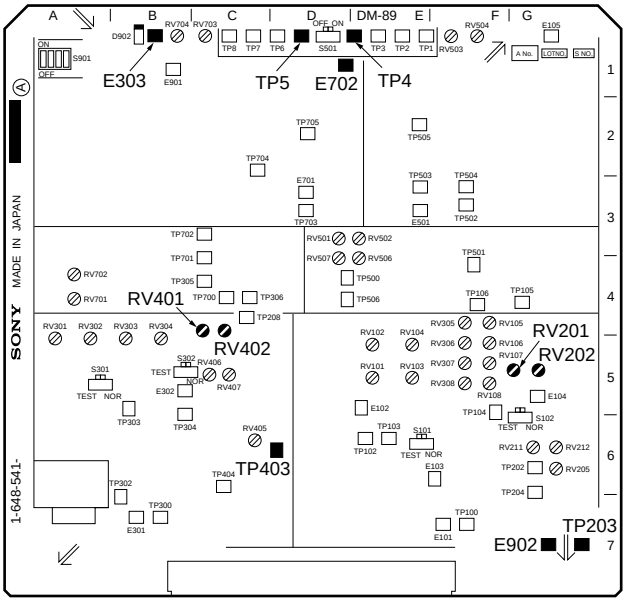
REMOTE/LOCAL ⇨ LOCAL (unlit 9P)

4. Check the setting on the sub control panel.

KEY INHIBIT switch ⇨ OFF

5. Check that the equipment has warmed up.

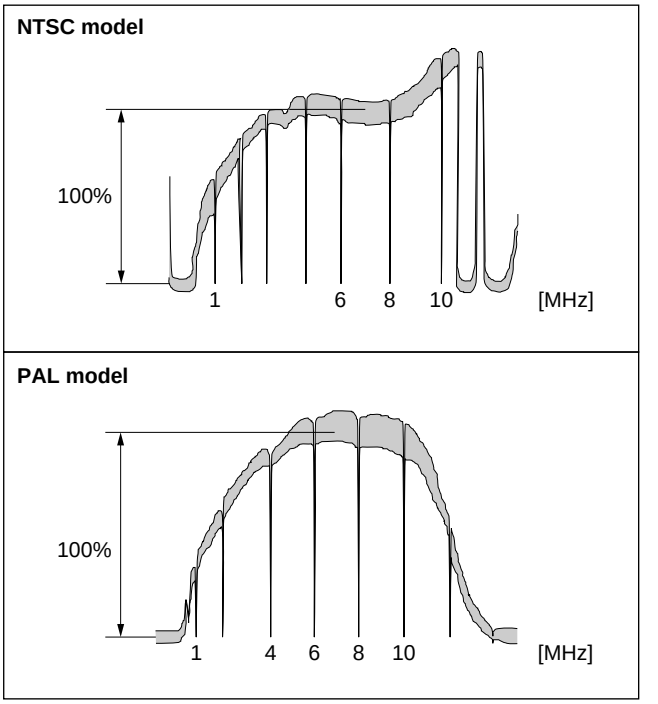
Before starting the adjustment, warm up the VTR and oscilloscope through the power for 20 minutes or more.



DM-89 Board (Side A)

1. METAL Y Adjustment

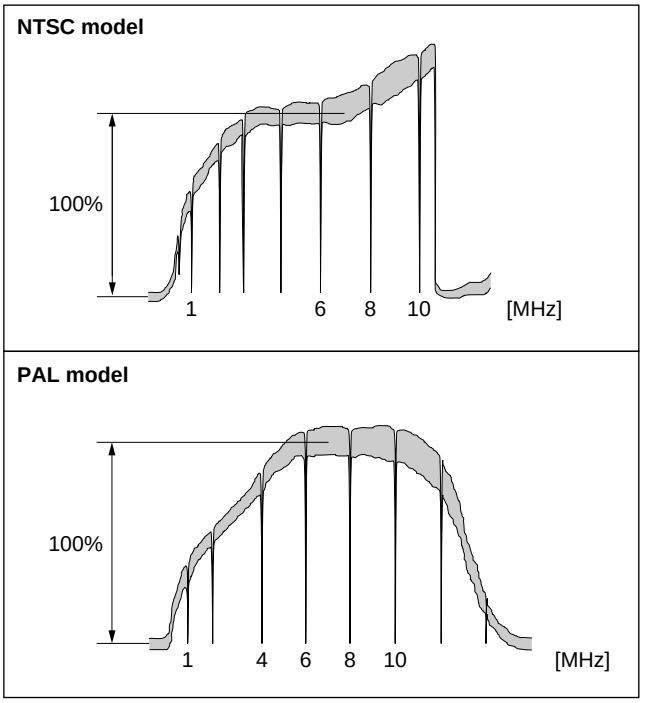
1. Connect and set the oscilloscope as follows:
   CH-1: TP203/DM-89(G-7), DC >200 mV/DIV
   GND: E902/DM-89(G-7)
   CH-2: TP4/DM-89(E-1), DC 1 V/DIV
   GND: E702/DM-89(D-1)
   TIME: 2 ms/DIV
   TRIG: CH-2, – slope
2. During play back the alignment tape in PLAY mode, measure the level at 6 MHz part.
   PB portion: RF sweep signal (0:00 to 2:00) of CR5-1B (NTSC) / CR5-1B PS (PAL)
   This measured level is reference level 100% (0 dB).
3. During play back the alignment tape in PLAY mode, adjust the levels at 8 MHz and 10 MHz parts.
   PB portion: The same as step 2
   Adj. point: ⊘RV201/DM-89(G-5)
   Specifications (Level at 6 MHz is 100% {0 dB}.):
   8 MHz: 100 ±20 % {0 ±2.0 dB}
   10 MHz: NTSC: 120 $^{+50}_{-20}$ % {2.0 $^{+5.0}_{-2.0}$ dB}
   PAL: 110 $^{+40}_{-20}$ % {1.0 $^{+4.0}_{-2.0}$ dB}



4. Stop the playback of the alignment tape.

2. METAL C Adjustment

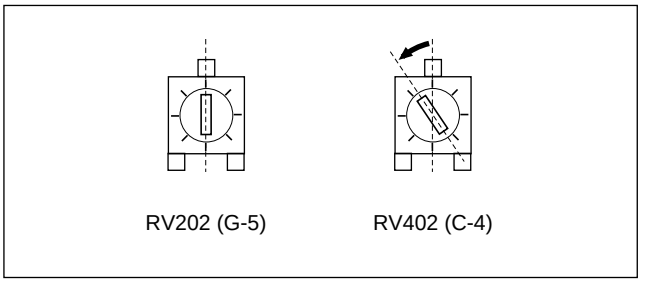
1. Change the connection of the oscilloscope as follows:
   CH-1: TP403/DM-89(D-6), GND: E303/DM-89(B-1)
   CH-2: TP5/DM-89(D-1), GND: E702/DM-89(D-1)
2. During play back the alignment tape in PLAY mode, measure the level at 6 MHz part.
   PB portion: RF sweep signal (0:00 to 2:00) of CR5-1B (NTSC) / CR5-1B PS (PAL)
   This measured level is reference level 100% (0 dB).
3. During play back the alignment tape in PLAY mode, adjust the levels at 8 MHz and 10 MHz parts.
   PB portion: The same as step 2
   Adj. point: ⊘RV401/DM-89(G-4)
   Specifications (Level at 6 MHz is 100% {0 dB}.):
   8 MHz: 100 ± 20 % {0 ± 2.0 dB}
   10 MHz: 110 $^{+40}_{-20}$ % {2.0 $^{+4.0}_{-2.0}$ dB}



4. Stop the playback of the alignment tape.
   Note
   It is not necessary to eject the alignment tape when perform subsequent "3-8-14. DM RF Output Level Readjustment".

3. OXIDE Y/C Adjustment

Set the following RVs on the DM-89 board to each specified position as shown figure below.



3-8-14. DM RF Output Level Readjustment

Readjust the DM RF output level referring to Section 3-8-7 again.

3-8-15. RF Envelope Adjustment

Preparing tools

- Oscilloscope: TEKTRONIX 2465B or equivalent
- Analog component video monitor

  Note

  This video monitor is for menu displaying. Be sure to connect it to VIDEO OUTPUT COMPOSITE 3 (SUPER) connector.
- Extension board: EX-377 (Part No. J-6269-810-A)
- Alignment tape

  For NTSC: CR5-1B (Part No. 8-960-096-41)

  For PAL: CR5-1B PS (Part No. 8-960-096-91)

Preparation

1. Extend the DM-89 board with an extension board EX-377.

Note

Before removing DM-89 board, wait for more than 30 seconds after turning off the POWER switch.

2. Check the switch settings on the DM-89 board.

Reset the switch settings on the DM-89 board to the factory settings. (Refer to step 1 in "3-8-2. Common Preparation".)

3. Check the setting on the upper control panel.

REMOTE/LOCAL ⇨ LOCAL (unlit 9P)

4. Check the setting on the sub control panel.

KEY INHIBIT switch ⇨ OFF

5. Check that the equipment has warmed up.

Before starting the adjustment, warm up the VTR and oscilloscope through the power for 20 minutes or more.

1. Threshold Level Setting (Check)

1. To enter the maintenance mode, press S1101(G-1) on the SS-63 board.
2. Enter A36 : DM VR 5, then check that the data of the following items in A35 : DM VR 4 are the specified data value. (If not, set them to the specified data.)

Item (A36 : DM VR 5)	Data
ENV-TH-H	20
ENV-TH-L	10

3. To exit A36 : DM VR 5, press the MENU button once.

Data save (Store the adjusted data)

When the data was not changed in step 2, skip over to step 6.

4. Enter A3F : NV-RAM CONTROL, then execute "SAVE ALL ADJUST DATA".
   - Message "Save Complete" is displayed on the video monitor when this data save is completed normally.

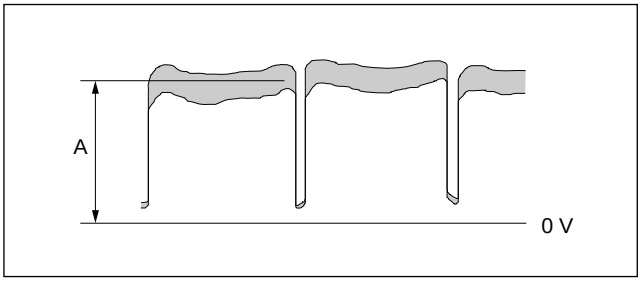
   Note

   When loading the previous data without save the current adjusted data, execute "ALL DATA PREVIOUS".
5. To exit A3F : NV-RAM CONTROL, press the MENU button once.

6. To exit the maintenance mode, press the MENU button three times.

2. Y Adjustment

1. Connect and set the oscilloscope as follows:
   CH-1: TP203/DM-89(G-7), DC 500 mV/DIV
   GND: E902/DM-89(G-7)
   CH-2: TP4/DM-89(E-1), DC 1 V/DIV
   GND: E702/DM-89(D-1)
   TIME: 5 ms/DIV
   TRIG: CH-2, – slope
2. During play back the alignment tape in PLAY mode, adjust the DC level at CH-1 on the oscilloscope.
   PB portion: Flat filed signal (24:00 to 26:00) of CR5-1B (NTSC) / CR5-1B PS (PAL)
   Adj. point: ◓RV205/DM-89(G-6)
   Specification: A = 2.0 ±0.2 V dc

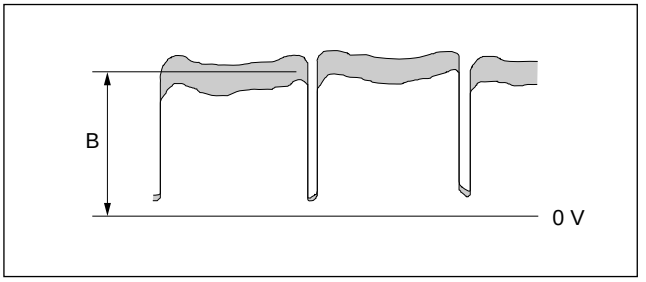


3. Stop the playback of the alignment tape.

3. C Adjustment

1. Change the connection of the oscilloscope as follows:
   CH-1: TP403/DM-89(D-6)
   GND: E303/DM-89(B-1)
   CH-2: TP5/DM-89(D-1)
   GND: E702/DM-89(D-1)

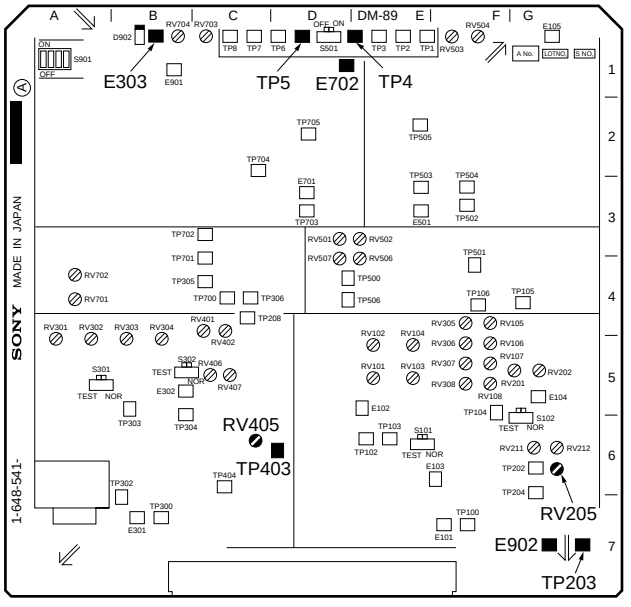
2. During play back the alignment tape in PLAY mode, adjust the DC level at CH-1 on the oscilloscope.
   PB portion: Flat filed signal (24:00 to 26:00) of CR5-1B (NTSC) / CR5-1B PS (PAL)
   Adj. point: ◓RV405/DM-89(C-6)
   Specification: B = 2.0 ±0.2 V dc



3. Stop the playback of the alignment tape.

Note

It is not necessary to eject the alignment tape when perform subsequent “3-8-16. Search Picture Adjustment”.



DM-89 Board (Side A)

3-8-16. Search Picture Adjustment

Preparing tools

- Oscilloscope: TEKTRONIX 2465B or equivalent
- Digital voltmeter: ADVANTEST TR6845 or equivalent
- Extension board: EX-377 (Part No. J-6269-810-A)
- Alignment tapes
  For NTSC: CR5-1B (Part No. 8-960-096-41)
  and CR5-2A (Part No. 8-960-097-44)
  For PAL: CR5-1B PS (Part No. 8-960-096-91)
  and CR5-2A PS (Part No. 8-960-098-44)
- 75 Ω terminators (5 pieces)
- Shorting clips (2 pieces)

Preparation

1. Extend the DM-89 board with an extension board EX-377.

Note

Before removing DM-89 board, wait for more than 30 seconds after turning off the POWER switch.

2. Check the switch settings on the DM-89 board.

Reset the switch settings on the DM-89 board to the factory settings. (Refer to step 1 in "3-8-2. Common Preparation".)

3. Check the setting on the upper control panel.

REMOTE/LOCAL ⇨ LOCAL (unlit 9P)

4. Check the setting on the sub control panel.

KEY INHIBIT switch ⇨ OFF

5. Check that the equipment has warmed up.

Before starting the adjustment, warm up the VTR and other equipment through the power for 20 minutes or more.

1. Voltage Adjustment

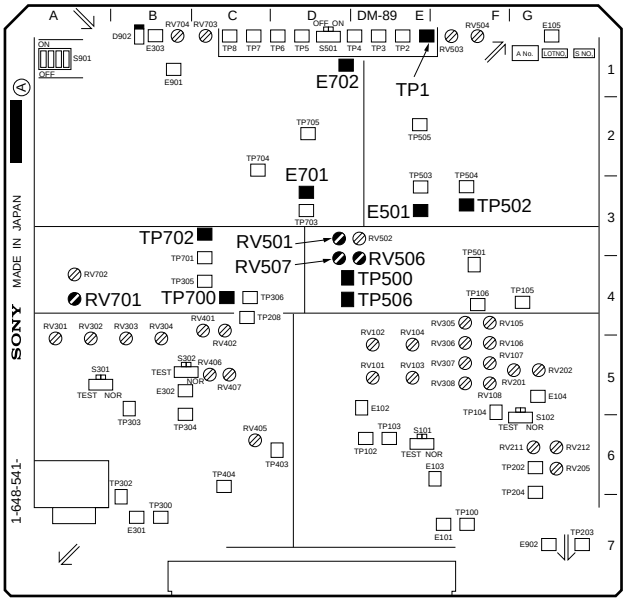
1. During play back the alignment tape in PLAY mode, using the digital voltage meter, measure each DC level at the following measurement points and fill up their measured levels on the following table.
   PB portion: Color-bar signal (14:00 to 17:00) of CR5-1B (NTSC) / CR5-1B PS (PAL)

Measurement point	Measured DC level (fill up)
TP500/DM-89(D-4)	_____
TP502/DM-89(F-3)	_____
TP702/DM-89(C-3)	_____

2. Stop the playback of the alignment tape.
3. Turn RV507/DM-89(D-4) fully clockwise (↻).
4. Short-circuit TP506/DM-89(D-4) and E501/DM-89 (E-3) with a shorting clip.
5. Short-circuit TP700/DM-89(C-4) and E701/DM-89 (D-3) with a shorting clip.
6. During play back the alignment tape in PLAY mode, adjust each DC level at the following measurement points.
   PB portion: The same as step 1
   Specification: The same measured DC level as step 1

Measurement point	Adjustment point	Remarks
TP500/DM-89(D-4)	⊘RV506/DM-89(E-4)	SPD OFFSET
TP502/DM-89(F-3)	⊘RV501/DM-89(D-3)	Y DEEM
TP702/DM-89(C-3)	⊘RV701/DM-89(A-4)	C DEEM

7. Remove the two shorting clips from DM-89 board.



DM-89 Board (Side A)

2. Gain Adjustment

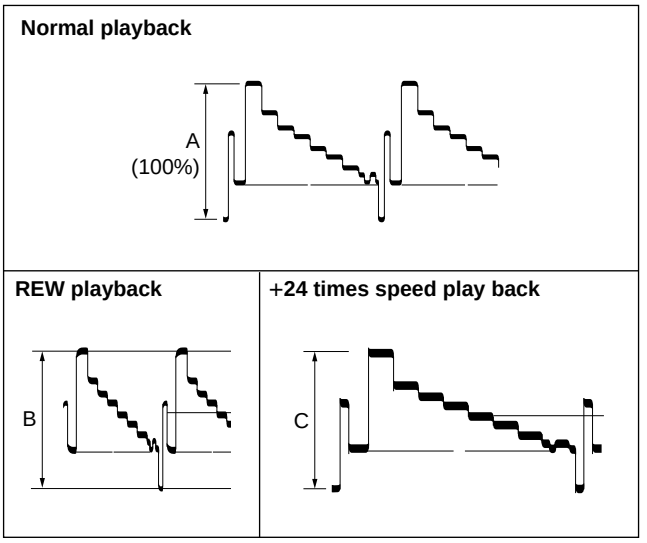
1. Connect and set the oscilloscope as follows:
   CH-1: TP1/DM-89(E-1), DC 1 V/DIV
   GND: E702/DM-89(D-1)
   TIME: 10 µs/DIV
2. During play back the alignment tape in PLAY mode, measure level of A on the oscilloscope.
   PB portion: Color-bar signal (14:00 to 17:00) of CR5-1B (NTSC) / CR5-1B PS (PAL)
   This measured level A is reference level 100% (0 dB).
3. During play back the alignment tape in the following playback mode, adjust the level of B on the oscilloscope.
   PB portion: The same as step 2
   NTSC: REW playback
   PAL: +24 times speed playback
   Adj. point: ⊘RV507/DM-89(D-4)
   Specification (Level in Normal PB is 100% {0 dB}.):
   NTSC: B = 100 ±3 % (0 ±0.2 dB)
   PAL: B = 105 ±5 % (0.4 ±0.4 dB)
4. During play back the alignment tape in the following playback mode, check level of C on the oscilloscope.
   PB portion: The same as step 2
   NTSC: +24 times speed playback
   PAL: REW playback
   Specification (Level in Normal PB is 100% {0 dB}.):
   C = 100 ±10 % (0 ±1.0 dB)
5. Stop the playback of the alignment tape.

Note

It is not necessary to eject the alignment tape when perform subsequent “3-8-17. Guard Band Width Adjustment”.

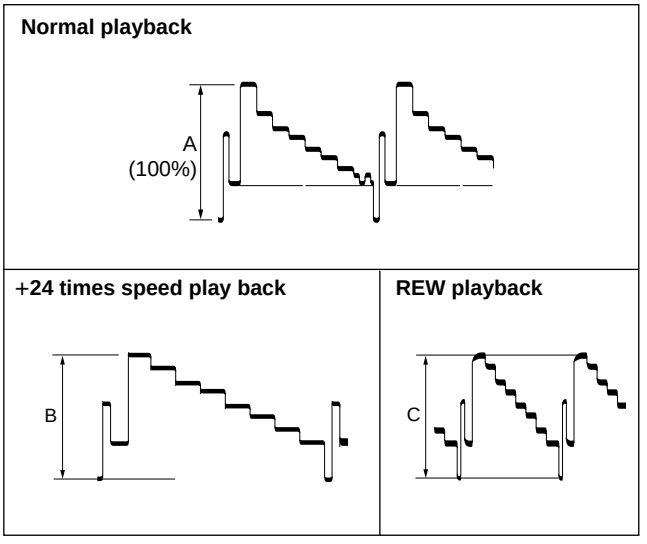
Specifications for NTSC model

Playback mode	Specification for NTSC model (Level A in normal speed is 100% {0 dB}.)
REW	Adjust: B = 100 ±3 % (0 ±0.2 dB)
+24 times speed	Check: C = 100 ±10 % (0 ±1.0 dB)



Specifications for PAL model

Playback mode	Specification for PAL model (Level A in normal speed is 100% {0 dB}.)
+24 times speed	Adjust: B = 105 ±5 % (0.4 ±0.4 dB)
REW	Check: C = 100 ±10 % (0 ±1.0 dB)



3-8-17. Guard Band Width Adjustment

Preparing tools

- Analog component video monitor

  Note

  Be sure to connect it to VIDEO OUTPUT COMPOSITE 3 (SUPER) connector.
- Alignment tapes

  For NTSC: CR5-1B (Part No. 8-960-096-41) and
  CR5-2A (Part No. 8-960-097-44)
  For PAL: CR5-1B PS (Part No. 8-960-096-91) and
  CR5-2A PS (Part No. 8-960-098-44)

Preparation

1. Check the switch settings on the DM-89 board.

Reset the switch settings on the DM-89 board to the factory settings. (Refer to step 1 in "3-8-2. Common Preparation".)

2. Check the setting on the upper control panel.

REMOTE/LOCAL ⇨ LOCAL (unlit 9P)

3. Check the settings on the sub control panel.

CHARACTER switch ⇨ ON
KEY INHIBIT switch ⇨ OFF

4. Check that the VTR has warmed up.

Before starting the adjustment, warm up the VTR through the power for 20 minutes or more.

1. Check the Initial Data

1. To enter the maintenance mode, press S1101(G-1) on the SS-63 board.
2. Enter A35 : DM VR 4, then check that the data of the following items in A35 : DM VR 4 are the specified data value. (If not, set them to the specified data.)

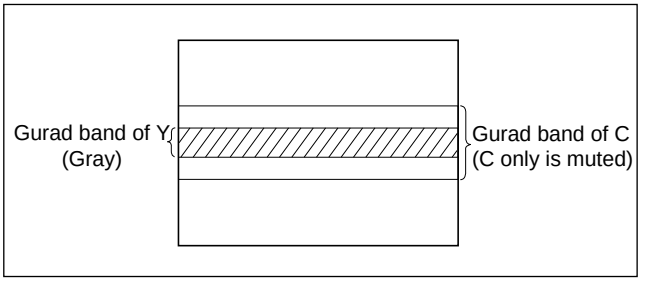
Item (A35 : DM VR 4)	Initial data for NTSC	Initial data for PAL
GUARD BAND METAL-Y	1D (38*)	27 (29*)
GUARD BAND METAL-C	1C (21*)	23 (16*)
GUARD BAND OXIDE-Y	32 (48*)	2F (3B*)
GUARD BAND OXIDE-C	31 (30*)	29 (16*)

*: When the board number suffix of the DM-89 board is 13.

3. To perform the tape operation, press the SET button once.
4. Set the CHARACTER switch to OFF.

2. METAL Guard Band Width Check

1. During play back the alignment tape in JOG mode, turn the search dial until guard band appears at the center on the video monitor screen.
   PB portion: Color-bar signal (14:00 to 17:00) of CR5-1B (NTSC) / CR5-1B PS (PAL)



Guard Band

2. Check the state of the guard band width.
   If the specification is not satisfied, check again after performing the following steps (1) through (5).
   Specification 1: Guard band width is below a third of video display screen's height.
   Specification 2: Width of C side > Width of Y side

If the specification 1 or 2 is not satisfied (METAL)

(1) Set the CHARACTER switch to ON.
(2) To operate the maintenance mode, press the MENU button once.
(3) When the specification 1 is not satisfied:
    Subtract 1 from each data of "GUARD BAND METAL-Y" and "GUARD BAND METAL-C" in A35 : DM VR 4.
    When the specification 2 is not satisfied:
    Add 1 to the data of "GUARD BAND METAL-C" in A35 : DM VR 4.
(4) To perform the tape operation, press the SET button once.
(5) Set the CHARACTER switch to OFF.
(6) Perform step 2 again.

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3. METAL Playback Check

1. During play back the alignment tape in VARIABLE +1 time speed mode (or the search +1 time speed mode), check that the picture (color-bar) on the video monitor is satisfied the following specifications.
   If the specification is not satisfied, check again after performing the following steps (1) through (5).
   PB portion: Color-bar signal (14:00 to 17:00) of CR5-1B (NTSC) / CR5-1B PS (PAL)
   Specification 3: The picture (color-bar) is colored. (The C signal is not fully muted.)

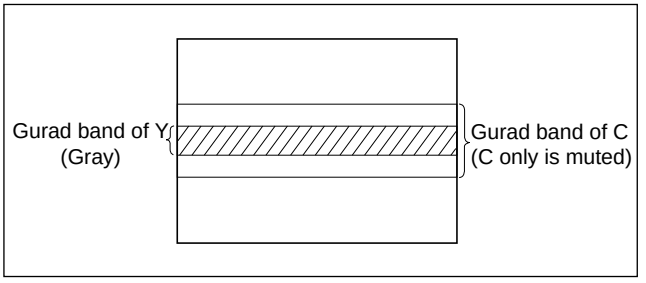
If the specification 3 is not satisfied (METAL)

(1) Set the CHARACTER switch to ON.
(2) To operate the maintenance mode, press the MENU button once.
(3) Subtract 1 from the data of “GUARD BAND METAL-C” in A35 : DM VR 4.
(4) To perform the tape operation, press the SET button once.
(5) Set the CHARACTER switch to OFF.
(6) Perform step 1 again.

2. Eject the alignment tape.

4. OXIDE Guard Band Width Check

1. During play back the alignment tape in JOG mode, turn the search dial until guard band appears at the center on the video monitor screen.
   PB portion: 75% color-bar signal (0:00 to 3:00) of CR5-2A (NTSC) / CR5-2A PS (PAL)



Guard Band

2. Check the state of the guard band width.
   If the specification is not satisfied, check again after performing steps (1) through (5).
   Specification 1: Guard band width is below a half of video display screen’s height.
   Specification 2: Width of C side > Width of Y side

If the specification 1 or 2 is not satisfied (OXIDE)

(1) Set the CHARACTER switch to ON.
(2) To operate the maintenance mode, press the MENU button once.
(3) When the specification 1 is not satisfied:
    Subtract 1 from each data of “GUARD BAND OXIDE-Y” and “GUARD BAND OXIDE-C” in A35 : DM VR 4.
    When the specification 2 is not satisfied:
    Add 1 to the data of “GUARD BAND OXIDE-C” in A35 : DM VR 4.
(4) To perform the tape operation, press the SET button once.
(5) Set the CHARACTER switch to OFF.
(6) Perform step 2 again.

5. OXIDE Playback Check

1. During play back the alignment tape in VARIABLE +1 time speed mode (or the search +1 time speed mode), check that the picture (color-bar) on the video monitor is satisfied the following specifications.
   If the specification is not satisfied, check again after performing the following steps (1) through (5).
   PB portion: 75% color-bar signal (0:00 to 3:00) of CR5-2A (NTSC) / CR5-2A PS (PAL)
   Specification 3: The picture (color-bar) is colored. (The C signal is not fully muted.)

If the specification 3 is not satisfied (OXIDE)

(1) Set the CHARACTER switch to ON.
(2) To operate the maintenance mode, press the MENU button once.
(3) Subtract 1 from the data of "GUARD BAND OXIDE-C" in A35 : DM VR 4.
(4) To perform the tape operation, press the SET button once.
(5) Set the CHARACTER switch to OFF.
(6) Perform step 1 again.

2. Eject the alignment tape.

6. Data Save (Store the Adjusted Data)

1. To operate the maintenance mode, press the MENU button once.
2. To exit A35 : DM VR 4, press the MENU button once.

When the data is not changed only, skip over to step 5.

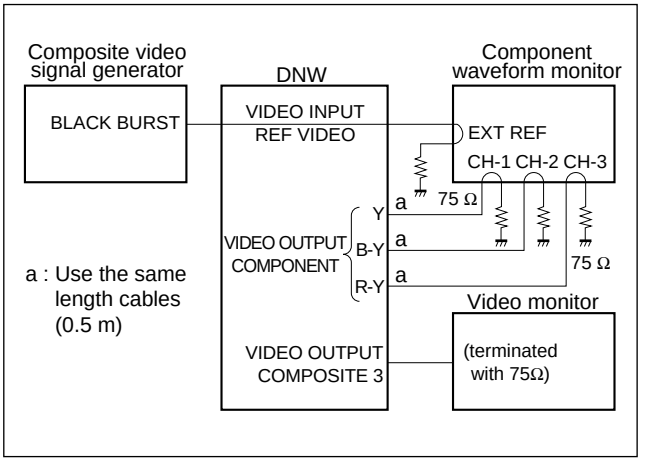
3. Enter A3F : NV-RAM CONTROL, then execute "SAVE ALL ADJUST DATA".
   • Message "Save Complete" is displayed on the video monitor when this data save is completed normally.
   Note
   When loading the previous data without save the current adjusted data, execute "ALL DATA PREVIOUS".
4. To exit A3F : NV-RAM CONTROL, press the MENU button once.

5. To exit the maintenance mode, press the MENU button three times.

3-8-18. Component Output Level Adjustment

Preparing tools

- Analog composite video signal generator
  For NTSC: TEKTRONIX TSG-170A or equivalent
  For PAL: TEKTRONIX TSG-271 or equivalent
- Analog component waveform monitor:
  TEKTRONIX WFM300 or equivalent
- Analog component video monitor
  Note
  This video monitor is for menu displaying.
- Alignment tapes
  For NTSC: CR5-1B (Part No. 8-960-096-41) and
  CR5-2A (Part No. 8-960-097-44)
  For PAL: CR5-1B PS (Part No. 8-960-096-91) and
  CR5-2A PS (Part No. 8-960-098-44)
- 75 Ω terminators (4 pieces)



Connection

Preparation

1. Check the switch setting on the SS-63 board.
S1100-1 (J-1) ⇨ ON

2. Check the switch settings on the DM-89 and TBC-23 boards.
Reset the switch settings on the DM-89 and TBC-23 boards to the factory settings. (Refer to step 1 in "3-8-2. Common Preparation".)

3. Check the setting on the upper control panel.
REMOTE/LOCAL ⇨ LOCAL (unlit 9P)

4. Check the settings on the sub control panel.
OUT REF switch ⇨ REF
PROCESS CONTROL switch ⇨ LOCAL
• VIDEO switch ⇨ PRESET
• CHROMA switch ⇨ PRESET
• SET UP or BLACK LEVEL switch ⇨ PRESET
• Y/C DELAY switch ⇨ PRESET
• CHROMA PHASE switch ⇨ PRESET
KEY INHIBIT switch ⇨ OFF

5. Check the setup extend menu settings. (NTSC model only)
ITEM-709: CAV LEVEL FORMAT
1. OUTPUT CAV LEVEL ⇨ B-CAM
ITEM-713: VIDEO SETUP REFERENCE LEVEL
0. MASTER LEVEL ⇨ 0.0%
3. BETACAM PB LEVEL ⇨ MSTER
4. OUTPUT LEVEL ⇨ MSTER

6. Connect the equipment.
(Refer to Figure "Connection".)

7. Check that the equipment has warmed up.
Before starting the adjustment, warm up the VTR and other equipment through the power for 20 minutes or more.

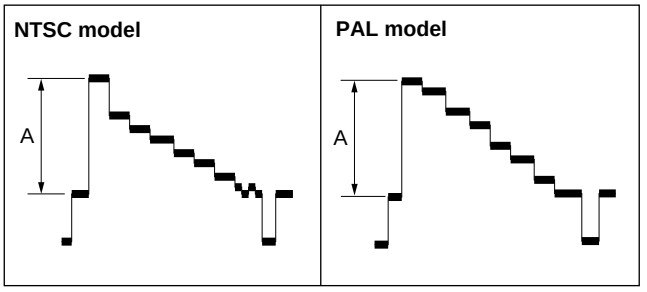
8. Stop the extending of the board.
Do not use the extension board in this adjustment.

Note

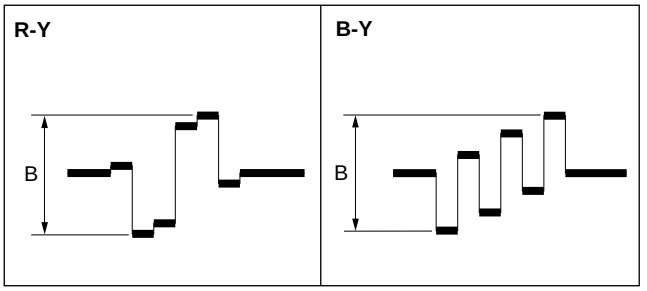
Before removing board, wait for more than 30 seconds after turning off the POWER switch.

1. METAL Y/C Check

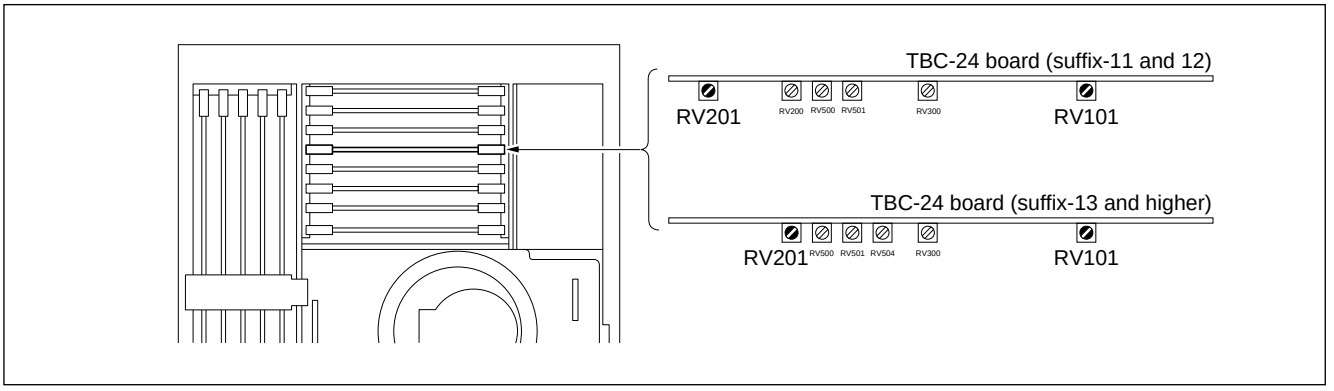
1. During play back the alignment tape in PLAY mode, check the white level of Y signal.
If the specification is not satisfied, adjust it.
PB portion: Color-bar signal (14:00 to 17:00) of CR5-1B (NTSC) / CR5-1B PS (PAL)
Adj. point: ⊘RV101/TBC-24(F-1)
Specification: NTSC: A = 714 ±7 mV (100 ±1 IRE)
PAL: A = 700 ±7 mV



2. During play back the alignment tape in PLAY mode, check the levels of R-Y and B-Y signals.
If the specification is not satisfied, adjust so that both levels of R-Y and B-Y signals satisfy the specification.
PB portion: The same as step 1
Adj. point: ⊘RV201/TBC-24(A/B-1)
Specification: B = 700 ±7 mV



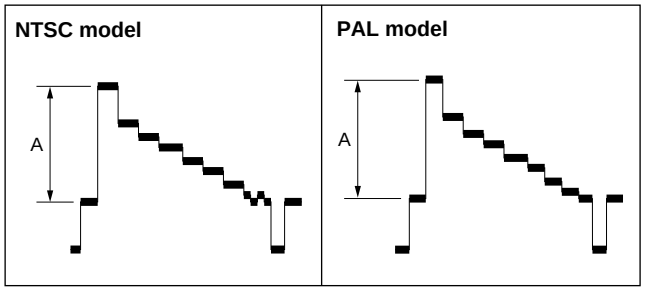
3. Eject the alignment tape.



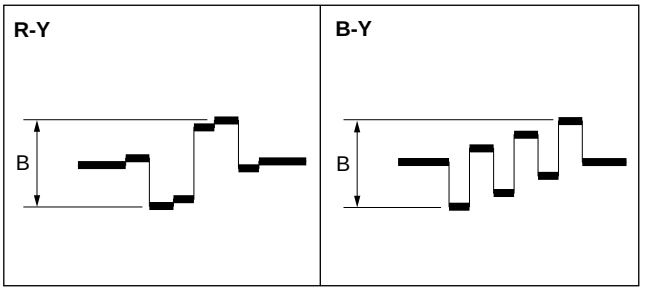
RV101 and RV201 on TBC-24 Board

2. OXIDE Y/C Check

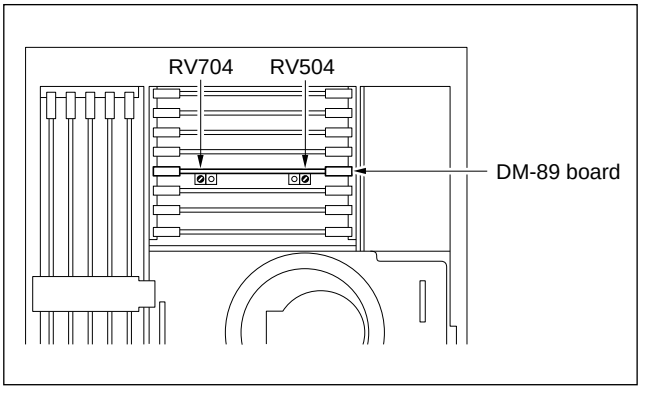
1. During play back the alignment tape in PLAY mode, check the white level of Y signal.
   If the specification is not satisfied, adjust it.
   PB portion: 75% color-bar signal (0:00 to 3:00) of CR5-2A (NTSC) / CR5-2A PS (PAL)
   Adj. point: ⊘RV504/DM-89(F-1)
   Specification: NTSC: A = 714 ± 7 mV (100 ± 1 IRE)
   PAL: A = 700 ± 7 mV



2. For PAL model only:
   During play back the alignment tape in PLAY mode, check the levels of R-Y and B-Y signals.
   If the specification is not satisfied, adjust so that both levels of R-Y and B-Y signals satisfy the specification.
   PB portion: 75% color-bar signal (0:00 to 3:00) of CR5-2A PS
   Adj. point: ⊘RV704/DM-89(B-1)
   Specification: B = 525 ± 5 mV



3. Eject the alignment tape.



RV504 and RV704 on DM-89 Board

3-8-19. A/D Clamp DC Level Adjustment

Note

The A/D clamp DC level adjustment is for the TBC-24 board of the board number suffix -11 or -12.
In the other suffixes, this adjustment is not necessary.

Preparing tools

- Oscilloscope: TEKTRONIX 2465B or equivalent
- Extension harness: 14P (Part No. 1-952-684-11)
- Extension board: EX-377 (Part No. J-6269-810-A)
- Alignment tape
  For NTSC: CR5-1B (Part No. 8-960-096-41)
  For PAL: CR5-1B PS (Part No. 8-960-096-91)

Preparation

1. Extend the TBC-24 board with an extension board EX-377 and an extension harness.

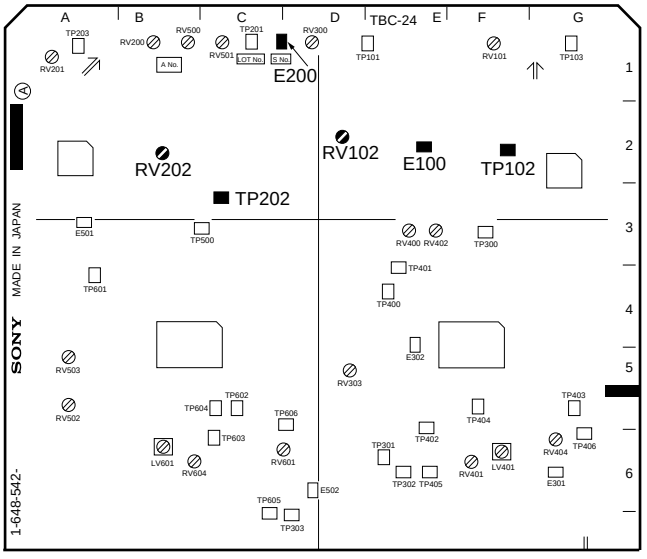
Note

Before removing TBC-24 board, wait for more than 30 seconds after turning off the POWER switch.

2. Check the setting on the upper control panel.
REMOTE/LOCAL ⇨ LOCAL (unlit 9P)

3. Check the setting on the sub control panel.
KEY INHIBIT switch ⇨ OFF

4. Check that the equipment has warmed up.
Before starting the adjustment, warm up the VTR and oscilloscope through the power for 20 minutes or more.



TBC-24 Board (Side A) (Suffix-11 and-12)

Measurement / Adjustment

1. If the alignment tape is inserted, eject it.
2. Connect and set the oscilloscope as follows:
   CH-1: TP202/TBC-24(C-3), 500 mV/DIV
   GND: E200/TBC-24(C-1)
   CH-2: TP102/TBC-24(F-2), 500 mV/DIV
   GND: E100/TBC-24(E-2)
   TIME: 10 µs
3. Set each GND level of the oscilloscope's CH-1 and CH-2 to the oscilloscope's scale.
4. Set the oscilloscope to CH-1 display mode.
5. Turn off the power of VTR, than wait for more than 1 minute.
6. Just after turning on the power, measure the DC level of CH-1 (TP202) on the oscilloscope, and fill up it measured level on the following table.
   (Measurement for C)
7. Turn the oscilloscope to CH-2 display mode.
8. Turn off the power of VTR, than wait for more than 1 minute.
9. Just after turning on the power, measure the DC level of CH-2 (TP102) on the oscilloscope, and fill up it measured level on the following table.
   (Measurement for Y)

Measurement point	Measured DC level (fill up)	Note
CH-1: TP202/TBC-24(C-3)	A = _____	C
CH-2: TP102/TBC-24(F-2)	B = _____	Y

10. Turn the oscilloscope to CH-1 display mode.
11. During play back the alignment tape in PLAY mode, adjust the DC level of CH-1 (TP202) on the oscilloscope. (Adjustment for C)
    PB portion: Color-bar signal (14:00 to 17:00) of CR5-1B (NTSC) / CR5-1B PS (PAL)
    Adj. point: ⊘RV202/TBC-24(B-2)
    Specification: Measured DC level = A (in step 6)
12. Turn the oscilloscope to CH-2 display mode.
13. During play back the alignment tape in PLAY mode, adjust the DC level of CH-2 (TP102) on the oscilloscope. (Adjustment for Y)
    PB portion: The same as step 11
    Adj. point: ⊘RV102/TBC-24(D-2)
    Specification: Measured DC level = B (in step 9)
14. Stop the playback of the alignment tape.

Note

It is not necessary to eject the alignment tape when perform subsequent "3-8-20. VCO Lock-in Range Adjustment".

3-8-20. VCO Lock-in Range Adjustment

Preparing tools

- Oscilloscope: TEKTRONIX 2465B or equivalent
- Extension harness: 14P (Part No. 1-952-684-11)
- Extension board: EX-377 (Part No. J-6269-810-A)
- Alignment tape
  For NTSC: CR5-1B (Part No. 8-960-096-41)
  For PAL: CR5-1B PS (Part No. 8-960-096-91)

Preparation

1. Extend the TBC-24 board with an extension board EX-377 and an extension harness.

Note

Before removing TBC-24 board, wait for more than 30 seconds after turning off the POWER switch.

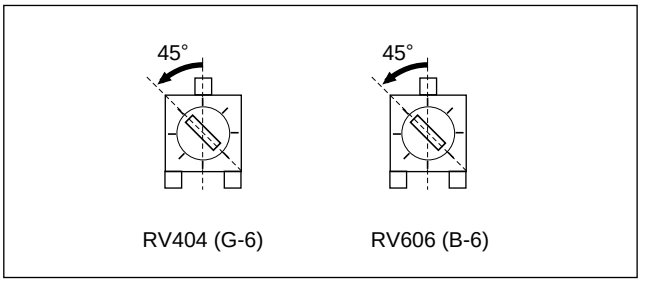
2. Check the setting on the upper control panel.
REMOTE/LOCAL ⇨ LOCAL (unlit 9P)

3. Check the setting on the sub control panel.
KEY INHIBIT switch ⇨ OFF

4. Check that the equipment has warmed up.
Before starting the adjustment, warm up the VTR and oscilloscope through the power for 20 minutes or more.

Adjustment

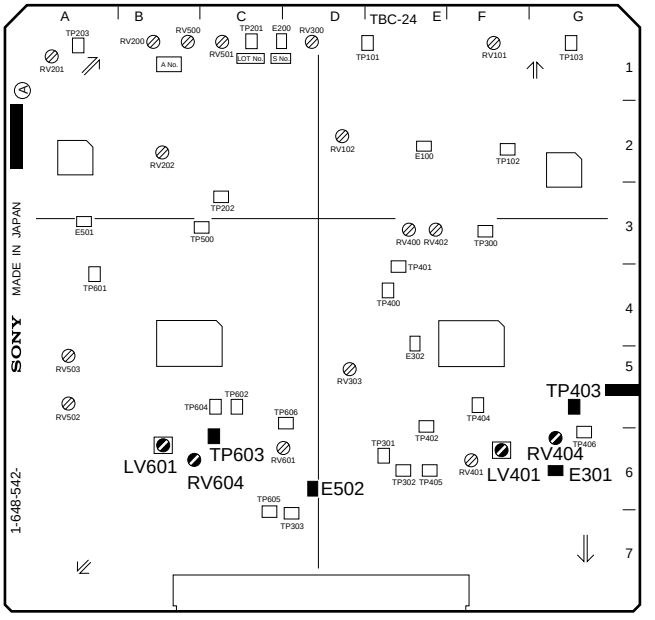
1. In the TBC-24 board of board number suffix -11 or -12, set the following RVs on the TBC-24 board to each specified position as shown figure below.



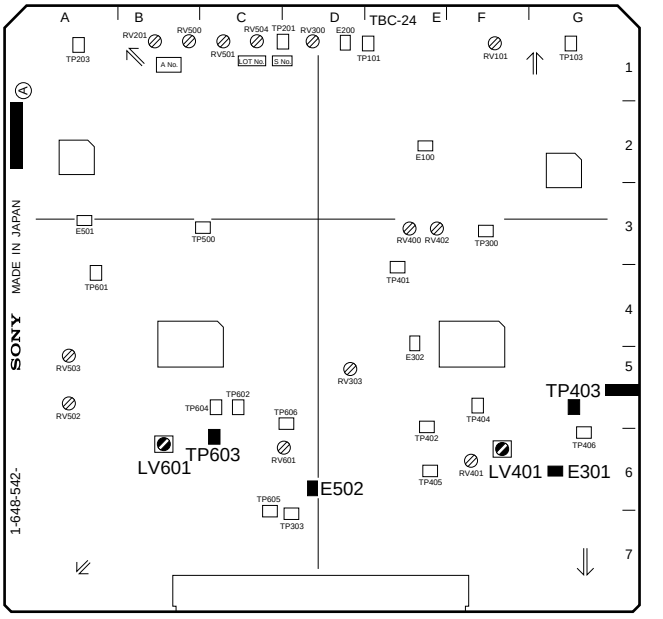
2. Connect and set the oscilloscope as follows:
   CH-1: TP403/TBC-24(G-5), DC 1 V/DIV
   GND: E301/TBC-24(G-6)
   CH-2: TP603/TBC-24(C-6), DC 1 V/DIV
   GND: E502/TBC-24(D-6)
3. During play back the alignment tape in PLAY mode, adjust each DC level of Y and C.
   PB portion: Color-bar signal (14:00 to 17:00) of CR5-1B (NTSC) / CR5-1B PS (PAL)
   Adj. points: Y (CH-1): ⊘LV401/TBC-24(F-6)
   C (CH-2): ⊘LV601/TBC-24(B-6)
   Specification: 2.0 ±0.2 V dc
4. Stop the playback of the alignment tape.

Note

It is not necessary to eject the alignment tape when perform subsequent “3-8-21. TBC VCO Free-running Adjustment”.



TBC-24 Board (Side A) (Suffix-11 and-12)



TBC-24 Board (Side A) (Suffix-13 and Higher)

3-8-21. TBC VCO Free-running Adjustment

Note

If RV303 on the TBC-24 board is replaced or it is turned by mistake, be sure to perform this adjustment, Section 3-8-23, and later.

Preparing tools

- Analog component video monitor

  Note

  Be sure to connect it to VIDEO OUTPUT COMPOSITE 3 (SUPER) connector.
- Extension harness: 14P (Part No. 1-952-684-11)
- Extension board: EX-377 (Part No. J-6269-810-A)
- Alignment tape
  For NTSC: CR5-1B (Part No. 8-960-096-41)
  For PAL: CR5-1B PS (Part No. 8-960-096-91)
- Shorting clip

Preparation

1. Extend the TBC-24 board with an extension board EX-377 and an extension harness.

Note

Before removing TBC-24 board, wait for more than 30 seconds after turning off the POWER switch.

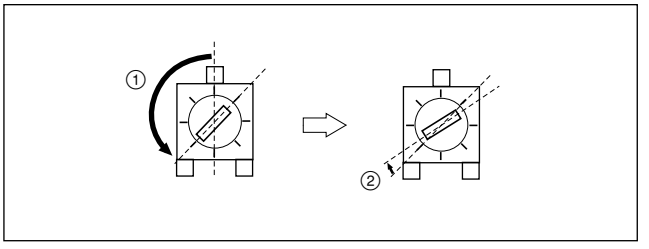
2. Check the setting on the upper control panel.
REMOTE/LOCAL ⇨ LOCAL (unlit 9P)

3. Check the setting on the sub control panel.
CHARACTER switch ⇨ OFF
KEY INHIBIT switch ⇨ OFF

4. Check that the VTR has warmed up.
Before starting the adjustment, warm up the VTR through the power for 20 minutes or more.

Adjustment

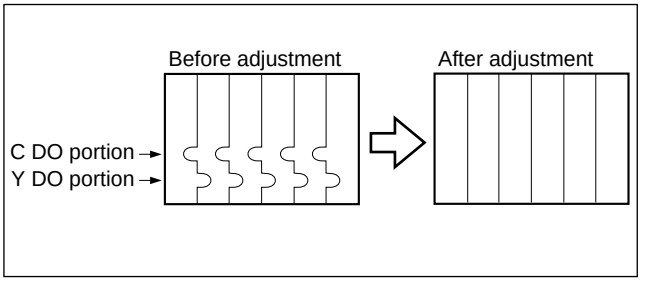
1. Set RV303/TBC-24(D-5) board to the specified



position as shown figure below.

When the TBC-24 board of board number suffix is 16 or higher only, perform steps 2 though 6.

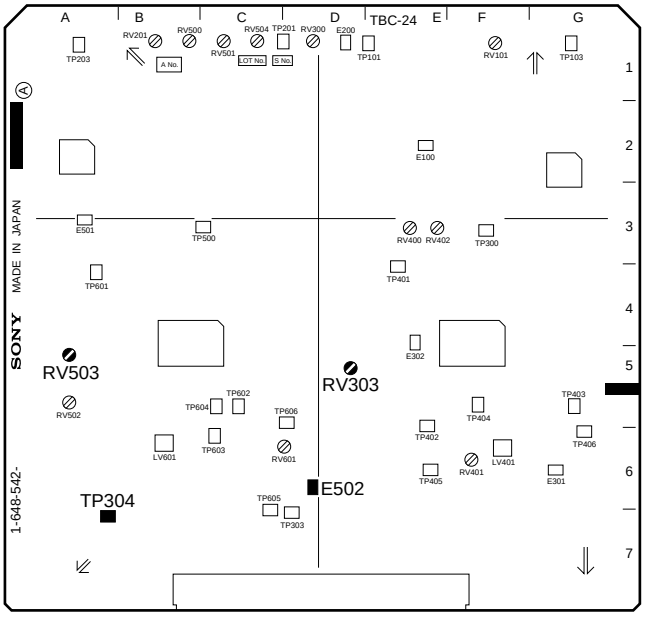
2. Short-circuit TP304/TBC-24(A-7) and E502/TBC-24 (D-6) with a shorting clip.
3. During play back the alignment tape in PLAY mode, check that the Y DO and C DO parts of playback picture (displaying color-bar) is no dorp-out.
   If drop-out is appeared, adjust the following RVs.
   PB portion: Color-bar signal with the drop-out (26:00 to 28:00) of CR5-1B (NTSC) / CR5-1B PS (PAL)
   Adj. points: Y DO: ⊘RV303/TBC-24(D-5)
   C DO: ⊘RV503/TBC-24(A-5)
   Specification: No dorp-out (on C DO and Y DO)



5. Stop the playback of the alignment tape.

   Note

   It is not necessary to eject the alignment tape when perform subsequent "3-8-22. FAST VCO Tracking Adjustment".
6. Remove the shorting clip.



TBC-24 Board (Side A) (Suffix 16 or Higher)

3-8-22. FAST VCO Tracking Adjustment

Preparing tools

- Analog component video monitor

  Note

  Be sure to connect it to VIDEO OUTPUT COMPOSITE 3 (SUPER) connector.
- Extension harness: 14P (Part No. 1-952-684-11)
- Extension board: EX-377 (Part No. J-6269-810-A)
- Alignment tapes

  For NTSC: CR5-1B (Part No. 8-960-096-41)
  and CR5-2A (Part No. 8-960-097-44)

  For PAL: CR5-1B PS (Part No. 8-960-096-91)
  and CR5-2A PS (Part No. 8-960-098-44)

Preparation

1. Extend the TBC-24 board with an extension board EX-377 and an extension harness.

Note

Before removing TBC-24 board, wait for more than 30 seconds after turning off the POWER switch.

2. Check the setting on the upper control panel.

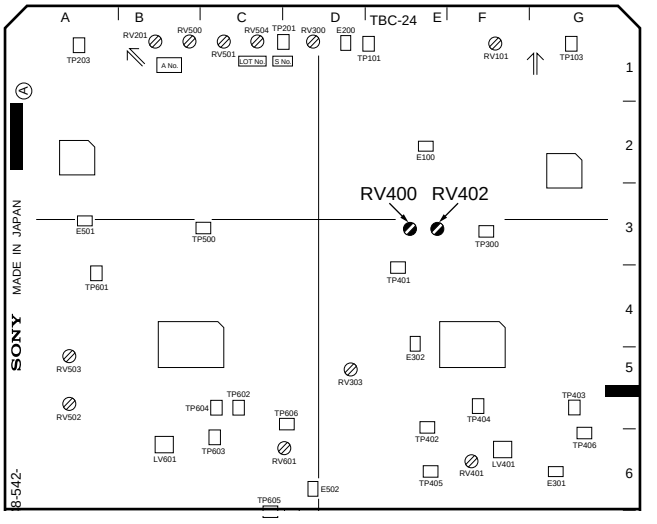
REMOTE/LOCAL ⇨ LOCAL (unlit 9P)

3. Check the setting on the sub control panel.

CHARACTER switch ⇨ OFF
KEY INHIBIT switch ⇨ OFF

4. Check that the VTR has warmed up.

Before starting the adjustment, warm up the VTR through the power for 20 minutes or more.



TBC-24 Board (Side A)

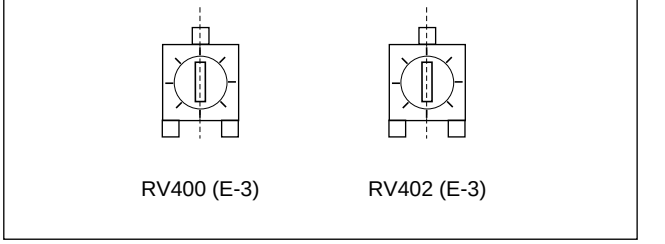
Adjustment

1. Set the following RVs on the TBC-24 board to each specified position as shown figure below.

   Note

   RV400 and RV402 are not equipped according to the model and the board number suffix of the TBC-24 board.

Suffix	RV400	RV402
11, 12, 13	With RV	With RV
14 and higher	Without RV	With RV for NTSC model Without RV for PAL model



RV400 (E-3) RV402 (E-3)

2. During play back the alignment tape in FF mode and REW mode, check that the picture (color-bar) displays on the video monitor.
   PB portion: Color-bar signal (14:00 to 17:00) of CR5-1B (NTSC) / CR5-1B PS (PAL)
3. During play back the alignment tape in SHUTTLE −24 time speed, check that the vertical lines of picture (color-bar) on the video monitor displays straight.
   If vertical lines are not straight, adjust RV402 on the TBC-24 board when RV402 is equipped.
   PB portion: The same as step 2
4. During play back the alignment tape in range from VARIABLE −10 time speed to fastest + speed, check that the vertical lines of picture (color-bar) on the video monitor displays straight.
   If vertical lines are not straight, adjust RV402 on the TBC-24 board when RV402 is equipped.
   PB portion: The same as step 2
5. Eject the alignment tape.
6. During play back the alignment tape in FF mode and REW mode, check that the picture (color-bar) displays on the video monitor.
   PB portion: 75% color-bar signal (0:00 to 3:00) of CR5-2A (NTSC) / CR5-2A PS (PAL)
7. Eject the alignment tape.

3-8-23. PB Video Phase Adjustment

Preparing tools

- Analog composite video signal generator
  For NTSC: TEKTRONIX TSG-170A or equivalent
  For PAL: TEKTRONIX TSG-271 or equivalent
- Analog component video signal generator:
  TEKTRONIX TSG-300 or equivalent

Note

It is required that the component video signal generator is able to output the 50% bowtie signal.

- Analog composite waveform/vector monitor:
  For NTSC: TEKTRONIX 1750, 1780R, or equivalent
  For PAL: TEKTRONIX 1751, 1781R, or equivalent
- Analog component waveform monitor:
  TEKTRONIX WFM300 or equivalent
- Analog component video monitor

Note

This video monitor is for menu displaying.

- Alignment tape
  For NTSC: CR5-1B (Part No. 8-960-096-41)
  For PAL: CR5-1B PS (Part No. 8-960-096-91)
- 75 Ω terminators (5 pieces)

Preparation

1. Check the switch setting on the SS-63 board.
S1100-1 (J-1) ⇨ ON

2. Check the switch settings on the TBC-23 Board.
Reset the switch settings on the TBC-23 board to the factory settings. (Refer to step 1 in "3-8-2. Common Preparation".)

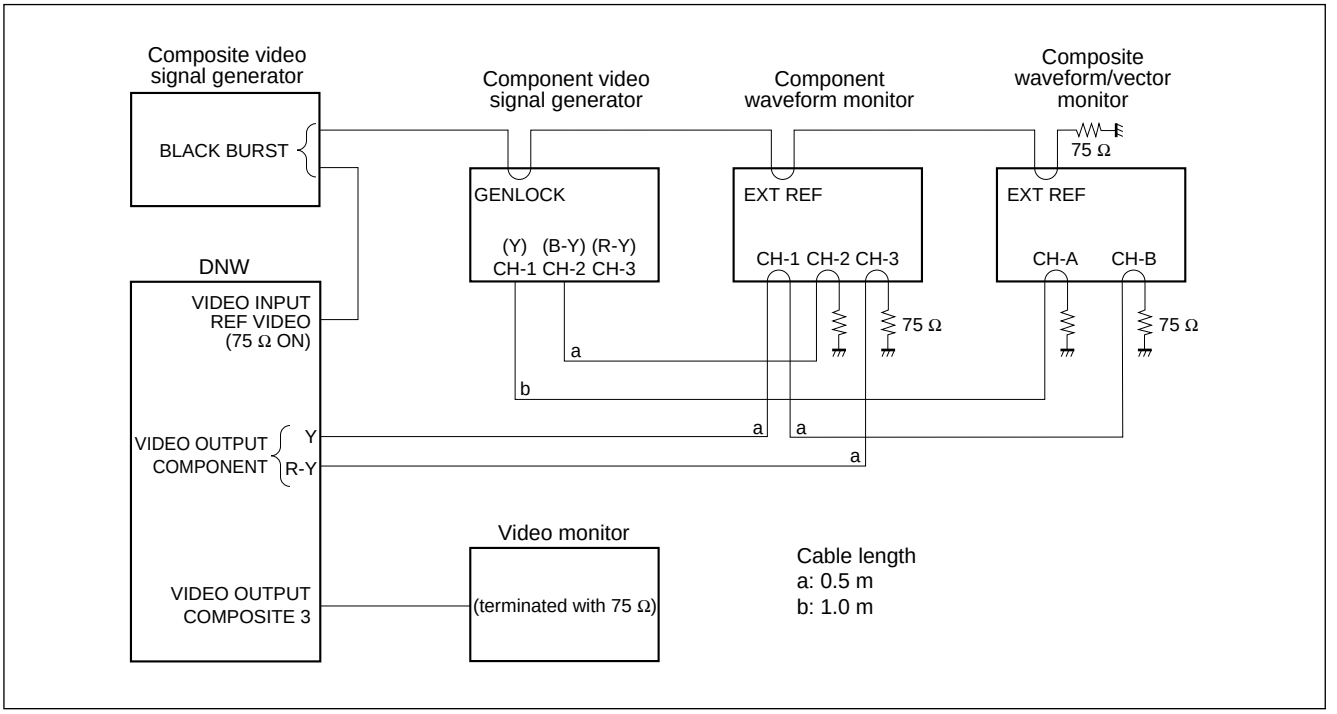
3. Stop the extending of the board.
Do not use the extension board in this adjustment.

Note

Before removing board, wait for more than 30 seconds after turning off the POWER switch.

4. Connect the equipment.
(Refer to Figure "Connection".)
Set a output of the analog component video signal generator to 50% bowtie signal.

5. Check the setting on the upper control panel.
REMOTE/LOCAL ⇨ LOCAL (unlit 9P)



Connection

6. Check the settings on the sub control panel.

CHARACTER switch ⇨ ON
OUT REF switch ⇨ REF
PROCESS CONTROL switch ⇨ LOCAL
• VIDEO switch ⇨ PRESET
• CHROMA switch ⇨ PRESET
• SET UP or BLACK LEVEL switch ⇨ PRESET
• Y/C DELAY switch ⇨ PRESET
• CHROMA PHASE switch ⇨ PRESET
KEY INHIBIT switch ⇨ OFF

7. Check the setup extend menu settings. (NTSC model only)

ITEM-709: CAV LEVEL FORMAT
1. OUTPUT CAV LEVEL ⇨ B-CAM
ITEM-713: VIDEO SETUP REFERENCE LEVEL
0. MASTER LEVEL ⇨ 0.0%
3. BETACAM PB LEVEL ⇨ MSTER
4. OUTPUT LEVEL ⇨ MSTER

8. Check that the equipment has warmed up.

Before starting the adjustment, warm up the VTR and other equipment through the power for 20 minutes or more.

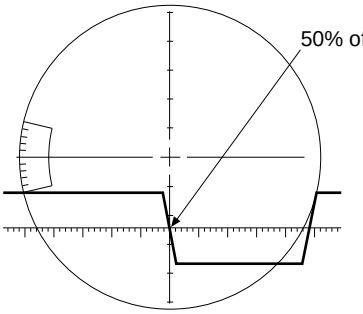
1. Check the Initial Data

1. To enter the maintenance mode, press S1101(G-1) on the SS-63 board.
2. Enter A37 : TBC VR, check that the data of “SQ Y RZ” is the following data value.
   NTSC model: 4C, PAL model: 4B
   If not, set it to above data.
3. To perform the tape operation, press the SET button once.

2. Set the System SYNC Position/Phase

1. Set the composite waveform/vector monitor as follows:
   WAVEFORM mode, SWEEP: 2H, MAG ON,
   INPUT: CH-A, EXT REF
2. Display the H SYNC part of CH-A on the composite waveform/vector monitor, and align 50% position at falling edge readability. (See Figure in step 4.)
3. Change the watching signal (channel) on composite waveform/vector monitor to CH-B.
4. During play back the alignment tape in PLAY mode, adjust the 50% position at falling edge of the H SYNC of CH-B to the identical position as CH-A using the SYNC control VR on the sub control panel.
   PB portion: 50% bowtie signal (17:00 to 19:00) of CR5-1B (NTSC) / CR5-1B PS (PAL)

Composite waveform/vector monitor (WAVEFORM mode)



5. Stop the playback of the alignment tape.
6. Set the composite waveform/vector monitor as follows:
   SCH mode, INPUT: CH-A, EXT REF
7. Align the SYNC phase of CH-A to 0 degree using the PHASE knob of the composite waveform/vector monitor. (See Figure in step 9.)

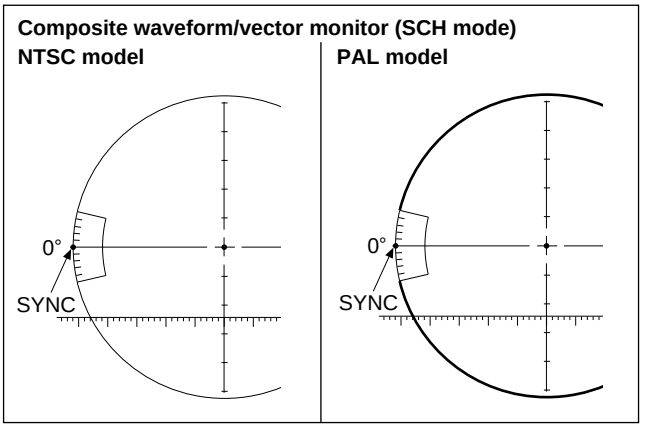
   Note

   Turn the PHASE knob so that the beam spot (SYNC) moves in the shortest route to 0 degree.
8. Change the watching signal (channel) on the composite waveform/vector monitor from CH-A to CH-B.
9. During play back the alignment tape in PLAY mode, adjust the SYNC (beam spot) of CH-B to 0 degree (the identical position as CH-A) using the SC control VR on the sub control panel.
   PB portion: The same as step 4

   Note

   Turn the SC control VR so that the beam spot (SYNC) moves in the shortest route to 0 degree.

Composite waveform/vector monitor (SCH mode)



10. Stop the playback of the alignment tape.

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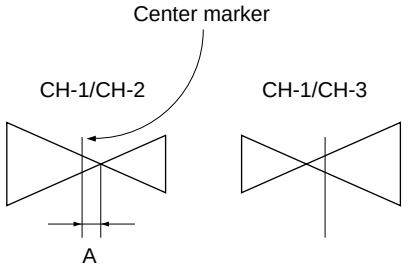
3. Y Phase Adjustment

1. Set the component waveform monitor to BOWTIE mode.
2. During play back the alignment tape in PLAY mode, adjust the deviation between the center marker and bowtie dip point of CH-1/CH-2 (Y/B-Y).
   PB portion: 50% bowtie signal (17:00 to 19:00) of CR5-1B (NTSC) / CR5-1B PS (PAL)
   Adj. point: ⊘RV300/TBC-24 (D-1)
   Specification: A = 0 ±10 ns
   If the specification is not satisfied by adjustment, perform steps (1) through (5), before readjusting.

Composite waveform/vector monitor (BOWTIE mode)



If the specification in step 2 is not satisfied only, perform the following steps (1) through (6).

(1) Set RV300 on the TBC-24 board to the mechanical center.
(2) Restart the playback of alignment tape from the top of PB portion in PLAY mode.
   PB portion: 50% bowtie signal (17:00 to 19:00) of CR5-1B (NTSC) / CR5-1B PS (PAL)
(3) To operate the maintenance mode, press the MENU button once.
(4) Change the data value of item “SQ Y RZ” within +1 or −1 so that the bowtie dip point moves closer to the center marker.
(5) To perform the tape operation, press the SET button once.
(6) Perform step 2 again.

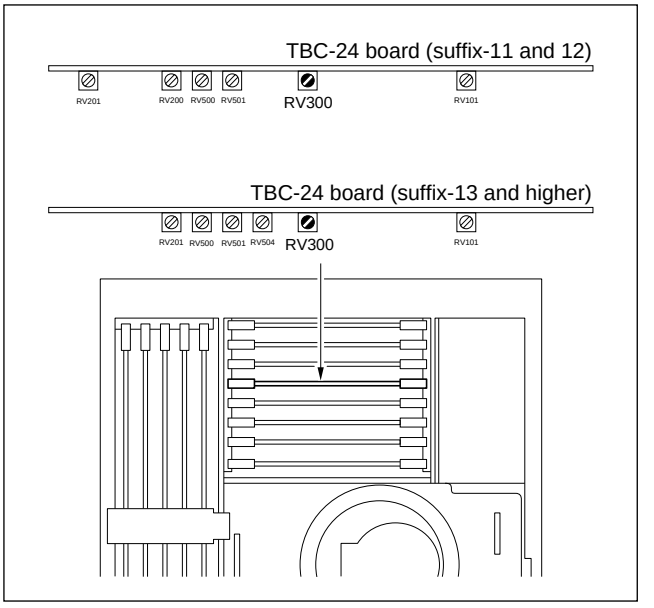
3. Stop the playback of the alignment tape.
   Note
   It is not necessary to eject the alignment tape when perform subsequent “3-8-24. TBC Y/C Delay Rough Adjustment”.
4. To operate the maintenance mode, press the MENU button once.
5. To exit A37 : TBC VR, press the MENU button once.

Data save (Store the adjusted data)

When the data of “SQ Y RZ” in A37 : TBC VR was not changed, skip over to step 8.

6. Enter A3F : NV-RAM CONTROL, then execute “SAVE ALL ADJUST DATA”.
   • Message “Save Complete” is displayed on the video monitor when this data save is completed normally.
   Note
   When loading the previous data without save the current adjusted data, execute “ALL DATA PREVIOUS”.
7. To exit A3F : NV-RAM CONTROL, press the MENU button once.

8. To exit the maintenance mode, press the MENU button three times.



RV300 on TBC-24 Board

3-8-24. TBC Y/C Delay Rough Adjustment

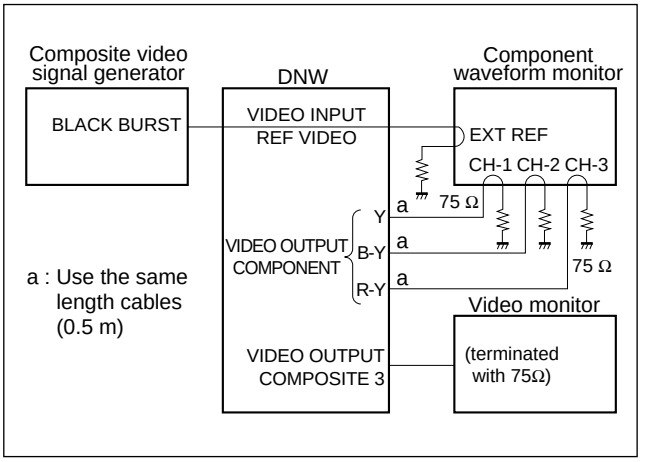
Preparing tools

- Analog composite video signal generator
  For NTSC: TEKTRONIX TSG-170A or equivalent
  For PAL: TEKTRONIX TSG-271 or equivalent
- Analog component waveform monitor:
  TEKTRONIX WFM300 or equivalent
- Analog component video monitor

Note

This video monitor is for menu displaying.

- Extension harness: 14P (Part No. 1-952-684-11)
- Extension board: EX-377 (Part No. J-6269-810-A)
- Alignment tape
  For NTSC: CR5-1B (Part No. 8-960-096-41)
  For PAL: CR5-1B PS (Part No. 8-960-096-91)
- 75 Ω terminators (4 pieces)



Connection

Preparation

1. Check the switch setting on the SS-63 board.

S1100-1 (J-1) ⇨ ON

2. Check the switch settings on the TBC-23 board.

Reset the switch settings on the TBC-23 board to the factory settings. (Refer to step 1 in "3-8-2. Common Preparation".)

3. Extend the TBC-24 board with an extension board EX-377 and an extension harness.

Note

Before removing TBC-24 board, wait for more than 30 seconds after turning off the POWER switch.

4. Connect the equipment.

(Refer to Figure "Connection".)

5. Check the setting on the upper control panel.

REMOTE/LOCAL ⇨ LOCAL (unlit 9P)

6. Check the settings on the sub control panel.

CHARACTER switch ⇨ ON
OUT REF switch ⇨ REF
PROCESS CONTROL switch ⇨ LOCAL
• VIDEO switch ⇨ PRESET
• CHROMA switch ⇨ PRESET
• SET UP or BLACK LEVEL switch ⇨ PRESET
• Y/C DELAY switch ⇨ PRESET
• CHROMA PHASE switch ⇨ PRESET
KEY INHIBIT switch ⇨ OFF

7. Check the setup extend menu settings. (NTSC model only)

ITEM-709: CAV LEVEL FORMAT
1. OUTPUT CAV LEVEL ⇨ B-CAM
ITEM-713: VIDEO SETUP REFERENCE LEVEL
0. MASTER LEVEL ⇨ 0.0%
3. BETACAM PB LEVEL ⇨ MSTER
4. OUTPUT LEVEL ⇨ MSTER

8. Check that the equipment has warmed up.

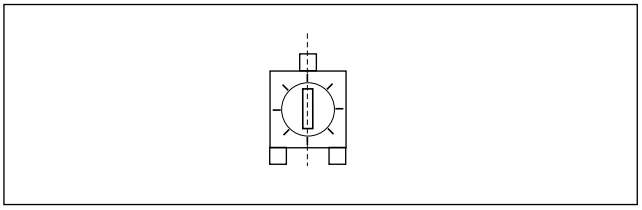
Before starting the adjustment, warm up the VTR and other equipment through the power for 20 minutes or more.

1. Check the Initial Data

1. To enter the maintenance mode, press S1101(G-1) on the SS-63 board.
2. Enter A37 : TBC VR, check that the data of “SQ C RZ” is the following data value.
   (If not, set it to above data.)
   NTSC model: 6F, PAL model: 6E
3. To perform the tape operation, press the SET button once.

2. Adjustment

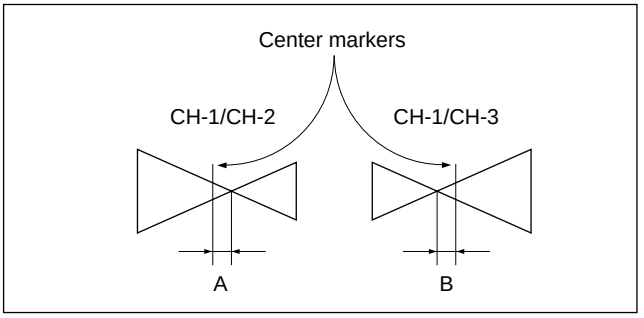
1. Set RV502/TBC-24(A-5) to the specified position as shown figure below.



2. Set the component waveform monitor to BOWTIE mode.
3. Start the playback of alignment tape from the top of PB portion in PLAY mode.
   PB portion: 50% bowtie signal (17:00 to 19:00) of CR5-1B (NTSC) / CR5-1B PS (PAL)
4. Adjust difference of deviations between each center marker and bowtie dip points of CH-1/CH-2 (Y/B-Y) and CH-1/CH-3 (Y/R-Y).
   Adj. point: ⊘RV503/TBC-24(A-5)
   Specification: A − B = 0 ± 10 ns
   (Refer to figure at step 5.)
5. Adjust the deviations A and B between each center marker and bowtie dip point of CH-1/CH-2 (Y/B-Y) and CH-1/CH-3 (Y/R-Y).
   Adj. points: Field 1: ⊘RV500/TBC-24(B-1)
   Field 2: ⊘RV504/TBC-24(C-1)
   Specifications: A = 0 ± 10 ns, B = 0 ± 10 ns
   If the specification is not satisfied by adjusting RV500, perform step (1) through (6).

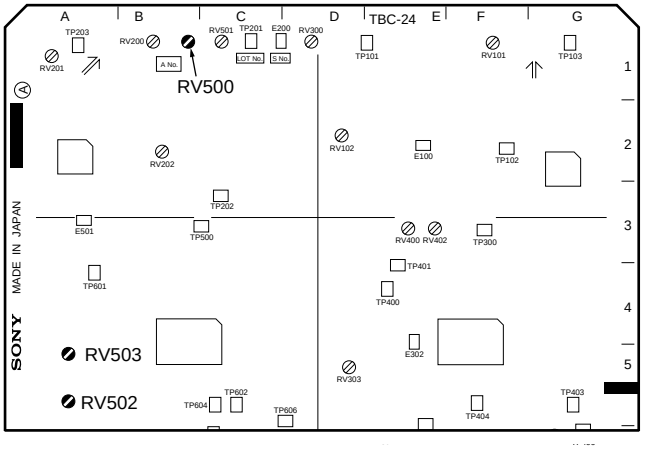
Note

As the TBC-24 board of the board number suffixes 11 and 12 is without RV504, adjust RV500 only.

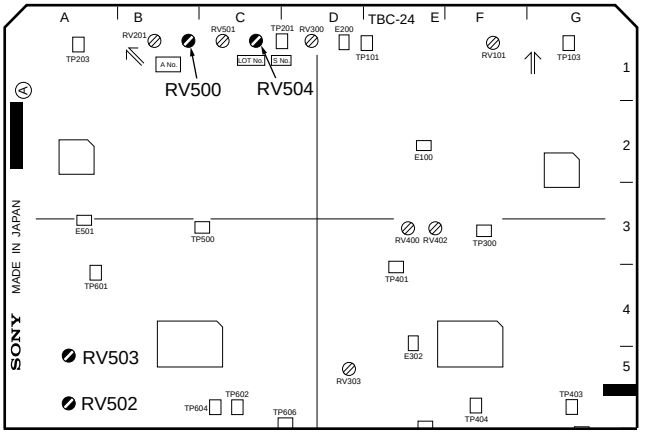


If the specification in step 5 is not satisfied only, perform following steps (1) through (6)

(1) Set RV500/TBC-24(B-1) to the mechanical center.
(2) Restart the playback of alignment tape from the top of PB portion in PLAY mode.
   PB portion: The same as step 3
(3) To operate the maintenance mode, press the MENU button once.
(4) Change the data value of item “SQ C RZ” within +2 or −2 so that the bowtie dip points move closer to center markers.
(5) To perform the tape operation, press the SET button once.
(6) Perform step 5 again.



TBC-24 Board (Side A) (Suffix-11 and -12)



TBC-24 Board (Side A) (Suffix-13 and Higher)

6. Stop the playback of the alignment tape.
   Note
   It is not necessary to eject the alignment tape when perform subsequent "3-8-25. Impact Error offset Alignment".
7. To operate the maintenance mode, press the MENU button once.
8. To exit A37 : TBC VR, press the MENU button once.

Data save (Store the adjusted data)

When the data of "SQ C RZ" in A37 : TBC VR was not changed, skip over to step 11.

9. Enter A3F : NV-RAM CONTROL, then execute "SAVE ALL ADJUST DATA".
   • Message "Save Complete" is displayed on the video monitor when this data save is completed normally.
   Note
   When loading the previous data without save the current adjusted data, execute "ALL DATA PREVIOUS".
10. To exit A3F : NV-RAM CONTROL, press the MENU button once.

11. To exit the maintenance mode, press the MENU button three times.

3-8-25. Impact Error Offset Adjustment

Preparing tools

- Analog component video monitor
  Note
  Be sure to connect it to VIDEO OUTPUT COMPOSITE 3 (SUPER) connector.
- Extension harness: 14P (Part No. 1-952-684-11)
- Extension board: EX-377 (Part No. J-6269-810-A)
- Alignment tape
  For NTSC: CR5-1B (Part No. 8-960-096-41)
  For PAL: CR5-1B PS (Part No. 8-960-096-91)

Preparation

1. Check the switch setting on the SS-63 board.
S1100-1 (J-1) ⇨ ON

2. Check the switch settings on the TBC-23 board.

Reset the switch settings on the TBC-23 board to the factory settings. (Refer to step 1 in "3-8-2. Common Preparation".)

3. Extend the TBC-24 board with an extension board EX-377 and an extension harness.

Note

Before removing the TBC-24 board, wait for more than 30 seconds after turning off the POWER switch.

4. Check the setting on the upper control panel.
REMOTE/LOCAL ⇨ LOCAL (unlit 9P)

5. Check the settings on the sub control panel.
CHARACTER switch ⇨ ON
PROCESS CONTROL switch ⇨ LOCAL
• VIDEO switch ⇨ PRESET
• CHROMA switch ⇨ PRESET
• SET UP or BLACK LEVEL switch ⇨ PRESET
• Y/C DELAY switch ⇨ PRESET
• CHROMA PHASE switch ⇨ PRESET
KEY INHIBIT switch ⇨ OFF

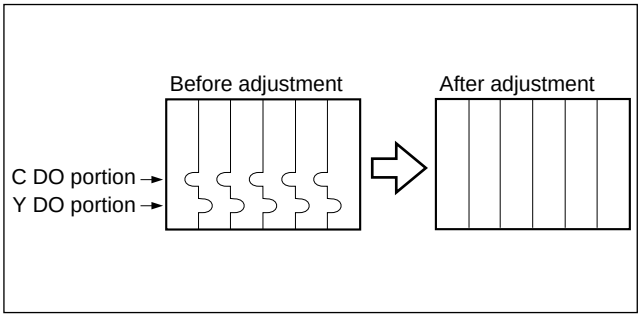
6. Check the setup extend menu settings. (NTSC model only)
ITEM-709: CAV LEVEL FORMAT
1. OUTPUT CAV LEVEL ⇨ B-CAM
ITEM-713: VIDEO SETUP REFERENCE LEVEL
0. MASTER LEVEL ⇨ 0.0%
3. BETACAM PB LEVEL ⇨ MSTER
4. OUTPUT LEVEL ⇨ MSTER

7. Check that the VTR has warmed up.

Before starting the adjustment, warm up the VTR through the power for 20 minutes or more.

Adjustment

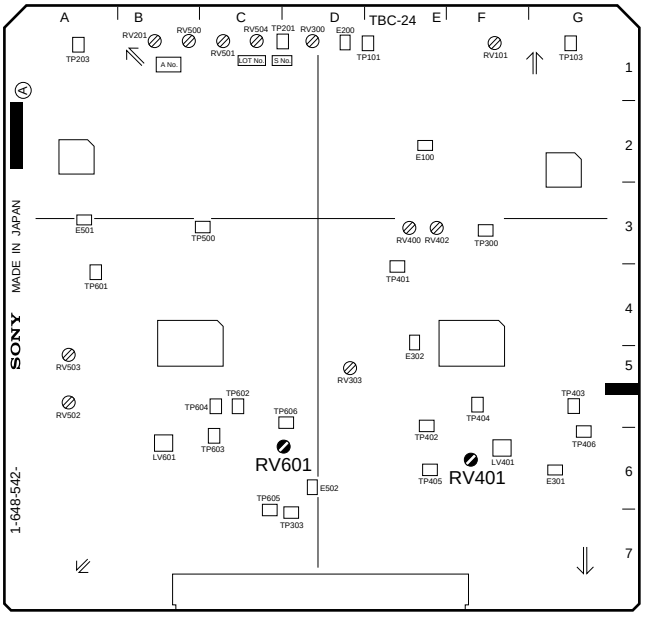
1. Start the playback of alignment tape in PLAY mode.
   PB portion: Color-bar signal with the drop-out (26:00 to 28:00) of CR5-1B (NTSC) / CR5-1B PS (PAL)
2. Check that the Y DO and C DO parts of playback picture (displaying color-bar) is no dorp-out.
   If drop-out is appeared, adjust the following RVs.
   Adj. points: Y DO: ⊘RV401/TBC-24(F-6)
   C DO: ⊘RV601/TBC-24(D-6)
   Specification: No dorp-out (on C DO and Y DO)



3. Stop the playback of the alignment tape.

Note

It is not necessary to eject the alignment tape when perform subsequent "3-8-26. TBC Y/C Delay Adjustment".



TBC-24 Board (Side A)

3-8-26. TBC Y/C Delay Adjustment

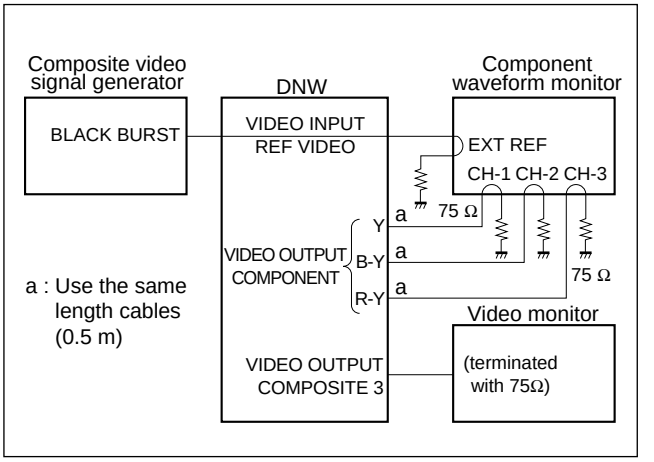
Preparing tools

- Analog composite video signal generator
  For NTSC: TEKTRONIX TSG-170A or equivalent
  For PAL: TEKTRONIX TSG-271 or equivalent
- Analog component waveform monitor:
  TEKTRONIX WFM300 or equivalent
- Analog component video monitor

Note

This video monitor is for menu displaying. Be sure to connect it to VIDEO OUTPUT COMPOSITE 3 (SUPER) connector.

- Alignment tapes
  For NTSC: CR5-1B (Part No. 8-960-096-41) and
  CR5-2A (Part No. 8-960-097-44)
  For PAL: CR5-1B PS (Part No. 8-960-096-91) and
  CR5-2A PS (Part No. 8-960-098-44)
- 75 Ω terminators (4 pieces)



Connection

Preparation

1. Stop the extending of the board.

Be sure to perform the adjustment without using the extension board.

Note

Before removing the board, wait for more than 30 seconds after turning off the POWER switch.

2. Check the switch setting on the SS-63 board.

S1100-1 (J-1) ⇨ ON

3. Check the switch settings on the TBC-23 board.

Reset the switch settings on the TBC-23 board to the factory settings. (Refer to step 1 in "3-8-2. Common Preparation".)

4. Connect the equipment.

(Refer to Figure "Connection".)

5. Check the setting on the upper control panel.

REMOTE/LOCAL ⇨ LOCAL (unlit 9P)

6. Check the settings on the sub control panel.

CHARACTER switch	⇨ ON
OUT REF switch	⇨ REF
PROCESS CONTROL switch	⇨ LOCAL
• VIDEO switch	⇨ PRESET
• CHROMA switch	⇨ PRESET
• SET UP or BLACK LEVEL switch	⇨ PRESET
• Y/C DELAY switch	⇨ PRESET
• CHROMA PHASE switch	⇨ PRESET
KEY INHIBIT switch	⇨ OFF

7. Check the setup extend menu settings. (NTSC model only)

ITEM-709: CAV LEVEL FORMAT
1. OUTPUT CAV LEVEL ⇨ B-CAM

ITEM-713: VIDEO SETUP REFERENCE LEVEL
0. MASTER LEVEL ⇨ 0.0%
3. BETACAM PB LEVEL ⇨ MSTER
4. OUTPUT LEVEL ⇨ MSTER

8. Check that the equipment has warmed up.

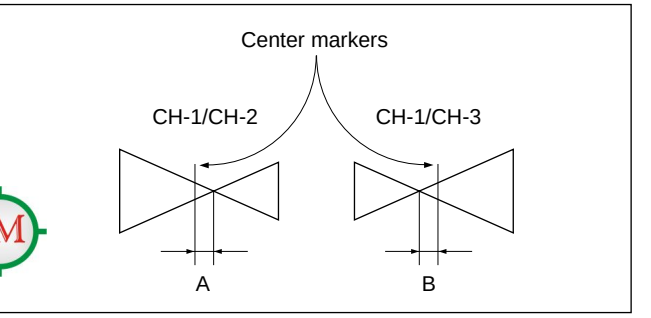
Before starting the adjustment, warm up the VTR and other equipment through the power for 20 minutes or more.

1. METAL Adjustment

1. Set the component waveform monitor to BOWTIE mode.
2. Start the playback of alignment tape in PLAY mode.
   PB portion: 50% bowtie signal (17:00 to 19:00) of CR5-1B (NTSC) / CR5-1B PS (PAL)
3. Adjust the deviations A and B between each center marker and bowtie dip point of CH-1/CH-2 (Y/B-Y) and CH-1/CH-3 (Y/R-Y).
   Adj. points: Field 1: ⊘RV500/TBC-24(B-1)
   Field 2: ⊘RV504/TBC-24(C-1)
   Specifications: A = 0 ±10 ns
   B = 0 ±10 ns

   Note

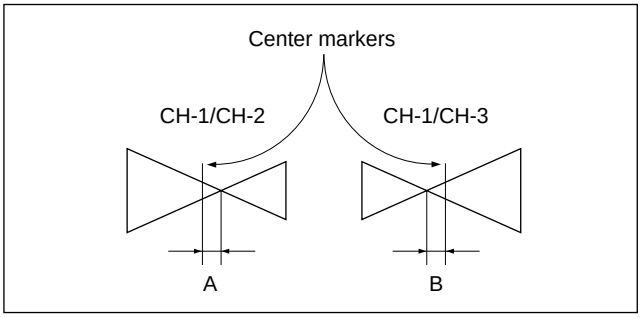
   As the TBC-24 board of the board number suffixes 11 and 12 is without RV504, adjust RV500 only.



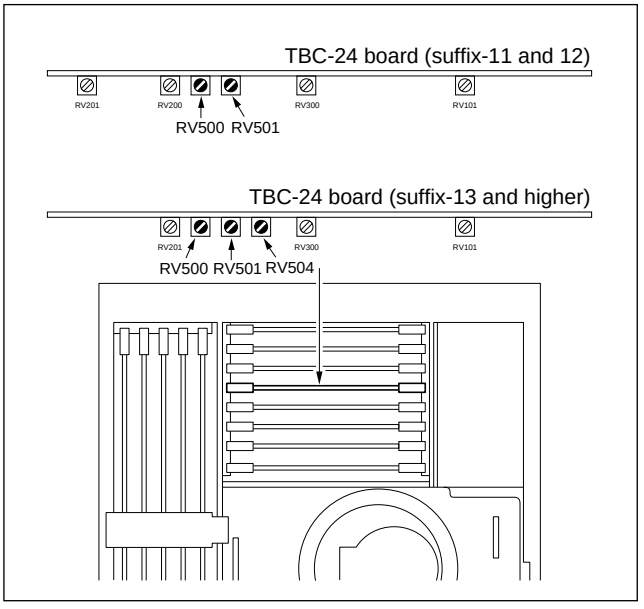
4. Eject the alignment tape.

2. OXIDE Adjustment

1. Start the playback of alignment tape in PLAY mode.
   PB portion: 50% bowtie signal (6:00 to 9:00) of
   CR5-2A (NTSC) / CR5-2A PS (PAL)
2. Adjust the deviations A and B between each center marker and bowtie dip point of CH-1/CH-2 (Y/B-Y) and CH-1/CH-3 (Y/R-Y).
   Adj. point: ⊘RV501/TBC-24(C-1)
   Specifications: A = 0 ±10 ns
   B = 0 ±10 ns



3. Eject the alignment tape.



RV500, RV501, and RV504 on TBC-24 Board

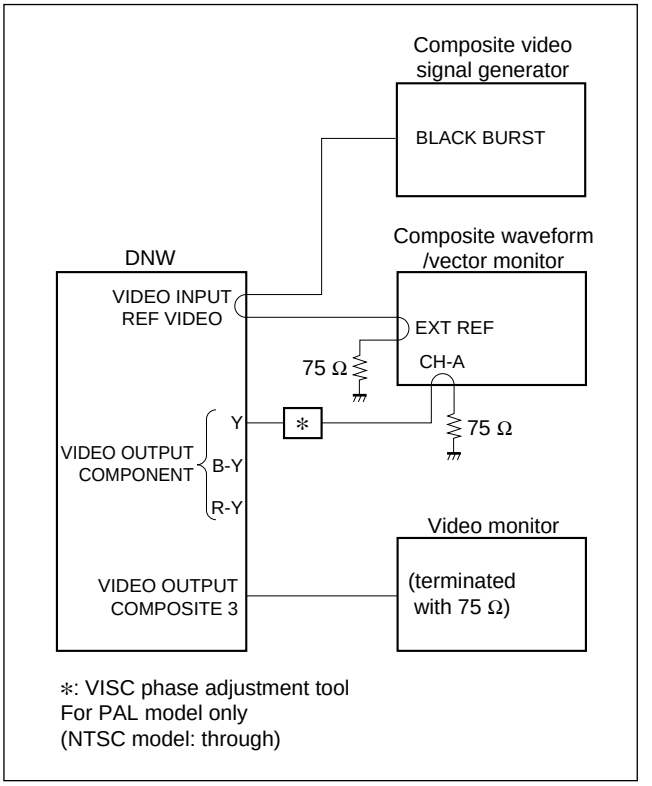
3-8-27. VISC Phase Adjustment

Preparing tools

- Analog composite video signal generator
  For NTSC: TEKTRONIX TSG-170A or equivalent
  For PAL: TEKTRONIX TSG-271 or equivalent
- Analog composite waveform/vector monitor:
  For NTSC: TEKTRONIX 1750, 1780R, or equivalent
  For PAL: TEKTRONIX 1751, 1781R, or equivalent
- Analog component video monitor

  Note

  This video monitor is for menu displaying. Be sure to connect it to VIDEO OUTPUT COMPOSITE 3 (SUPER) connector.
- Alignment tape
  For NTSC: CR5-1B (Part No. 8-960-096-41)
  For PAL: CR5-1B PS (Part No. 8-960-096-91)
- 75 Ω terminators (2 pieces)



Connection

Preparation

1. Stop the extension of the board.

Be sure to perform the adjustment without using the extension board.

Note

Before removing the board, wait for more than 30 seconds after turning off the POWER switch.

2. Check the switch setting on the SS-63 board.

S1100-1 (J-1) ⇨ ON

3. Check the switch settings on the TBC-23 board.

Reset the switch settings on the TBC-23 board to the factory settings. (Refer to step 1 in "3-8-2. Common Preparation".)

4. Connect the equipment.

(Refer to Figure "Connection".)

5. Check the setting on the upper control panel.

REMOTE/LOCAL ⇨ LOCAL (unlit 9P)

6. Check the settings on the sub control panel.

CHARACTER switch	⇨ ON
OUT REF switch	⇨ REF
PROCESS CONTROL switch	⇨ LOCAL
• VIDEO switch	⇨ PRESET
• CHROMA switch	⇨ PRESET
• SET UP or BLACK LEVEL switch	⇨ PRESET
• Y/C DELAY switch	⇨ PRESET
• CHROMA PHASE switch	⇨ PRESET
KEY INHIBIT switch	⇨ OFF
CAPSTAN LOCK switch	⇨ 2FD

7. Check the setup extend menu settings. (NTSC model only)

ITEM-709: CAV LEVEL FORMAT

1. OUTPUT CAV LEVEL	⇨ B-CAM

ITEM-713: VIDEO SETUP REFERENCE LEVEL

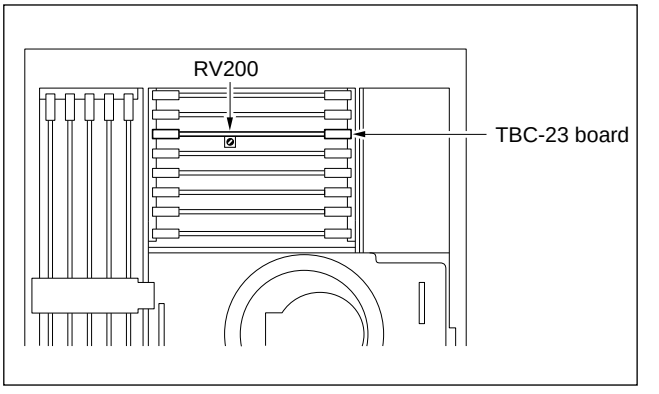
0. MASTER LEVEL	⇨ 0.0%
3. BETACAM PB LEVEL	⇨ MSTER
4. OUTPUT LEVEL	⇨ MSTER

8. Check that the equipment has warmed up.

Before starting the adjustment, warm up the VTR and other equipment through the power for 20 minutes or more.

1. Check the Initial Data

1. To enter the maintenance mode, press S1101 (G-1) on the SS-63 board.
2. Enter A37 : TBC VR, check that the data of "VISC PHASE" is the following data value.
   NTSC model: 06, PAL model: 02
   If not, set it to above data.
3. To perform the tape operation, press the SET button once.



RV200 on TBC-23 Board

2. Adjustment

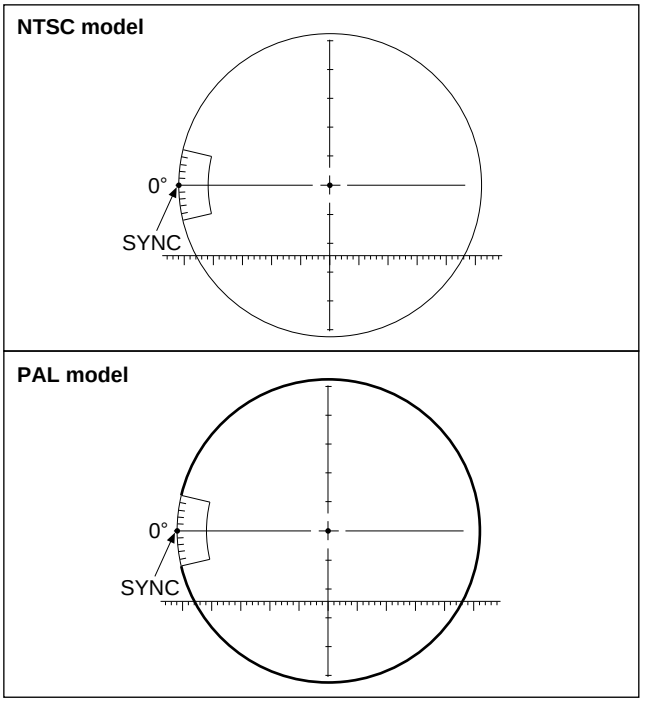
1. Set the composite waveform/vector monitor as follows:
   SCH mode, INPUT: CH-A, EXT REF
2. Start the playback of alignment tape from the top of PB portion in PLAY mode.
   PB portion: H sweep signal with VISC signal (28:00 to 30:00) of CR5-1B (NTSC) / CR5-1B PS (PAL)

   Note

   To confirm that the specifications are satisfied in step 8 within two minutes after starting the playback, be sure to complete the working in a short time.
   If the playback signal is changed another on steps to step 9, return to step 2 and restart.
3. Set the CAPSTAN LOCK switch on the sub control panel as follows, then return it to 2FD after 2 seconds.
   NTSC model: 4FD, PAL model: 8FD
4. Set the SYNC to 0 degree using PHASE control knob of the composite waveform/vector monitor.

   Note

   Turn the PHASE control knob so that the beam spot (SYNC) moves in the shortest route to 0 degree.

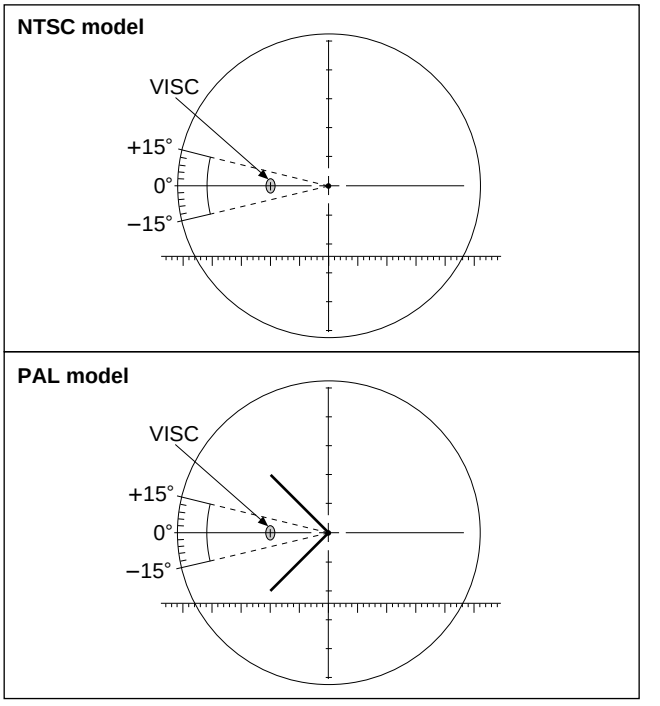


Composite waveform/vector monitor (SCH mode)

5. Set the composite waveform/vector monitor as follows:
   NTSC model: VECTOR mode, Line select: 11, EXT REF
   PAL model: VECTOR mode, Line select: 8, EXT REF
6. Align the center position of VISC (beam spot) to 0 degree with PHASE knob of the composite waveform/vector monitor.

   Note

   Turn the PHASE knob so that the beam spot (VISC) moves in the shortest route to the specified position.
7. Set the CAPSTAN LOCK switch on the sub control panel as follows:
   NTSC model: 4FD, PAL model: 8FD
8. Adjust the center position of VISC (beam spot).
   Adj. point: ◓RV200/TBC-23(C-1)
   Specifications: Center of beam spot: 0 ± 5°
   Jitters of beam spot: 0 ± 15°
   If the specification is not satisfied, readjust after performing steps (1) through (4) on next page.



Composite waveform/vector monitor (VECTOR mode)

If the specification in step 8 is not satisfied only, perform steps (1) through (5).

(1) Set RV200 on the TBC-24 board to the mechanical center.
(2) To operate the maintenance mode, press the MENU button once.
(3) Change the data value of item “VISC PHASE” within +1 or −1 so that the center of VISC (beam spot) moves closer to 0 degree.
(4) To perform the tape operation, press the SET button once.
(5) Perform step 8 again.

9. Stop the playback of the alignment tape, and eject it.
10. To operate the maintenance mode, press the MENU button once.
11. To exit A37 : TBC VR, press the MENU button once.

Data save (store the adjusted data)

When the data of “VISC PHASE” in A37 : TBC VR was not changed, skip over to step 14.

12. Enter A3F : NV-RAM CONTROL, then execute “SAVE ALL ADJUST DATA”.
    - Message “Save Complete” is displayed on the video monitor when this data save is completed normally.

    Note

    When loading the previous data without save the current adjusted data, execute “ALL DATA PREVIOUS”.
13. To exit A3F : NV-RAM CONTROL, press the MENU button once.

14. To exit the maintenance mode, press the MENU button three times.

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3-9. TBC Remote Control Offset Adjustment (FP-91 Board)

When the CAV control level conversion circuit (about IC7 to IC10) on the FP-91 board was repaired, perform this adjustment.

Note

Before attaching the panel of the upper control panel, perform this adjustment.

Tools

- Digital voltmeter: ADVANTEST TR6845 or equivalent
- Something to short-circuit the D-SUB connector's pins

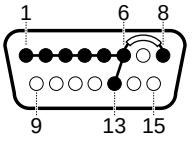
Note

There is a convenient with the shorting connector as follows:

Used component:

D-SUB connector (female) (Part No. 1-561-610-21)

Short the pins through 6, 8, and 13 of the connector.



Note: Be sure to connect the pin 8 with the covered wire.

Shorting Connector

Preparation

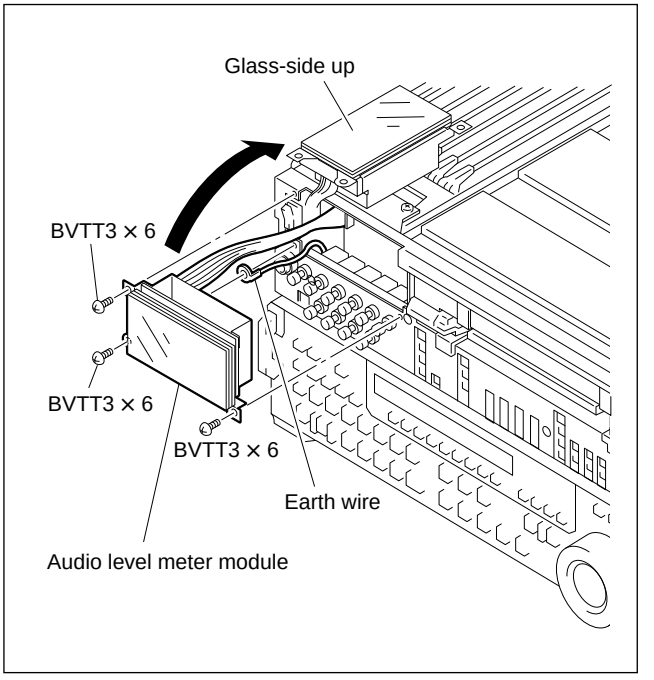
1. If the upper control panel was reattached, remove it. (Refer to Section 2-3-2 of the maintenance manual part 1.)
2. Unscrew the three screws and remove the audio level meter module.

   Note

   There is glass part in the module. Be sure to handle with care.
3. Disconnect the harness from the audio level meter module.

   Note

   Be sure place the audio level meter module on the its glass-side up.



Removing of Audio Level Meter Module

4. Connect the power cord. (POWER switch is OFF.)
5. Turn on the POWER switch and warm up the VTR and digital voltmeter through the power for 20 minutes or more.

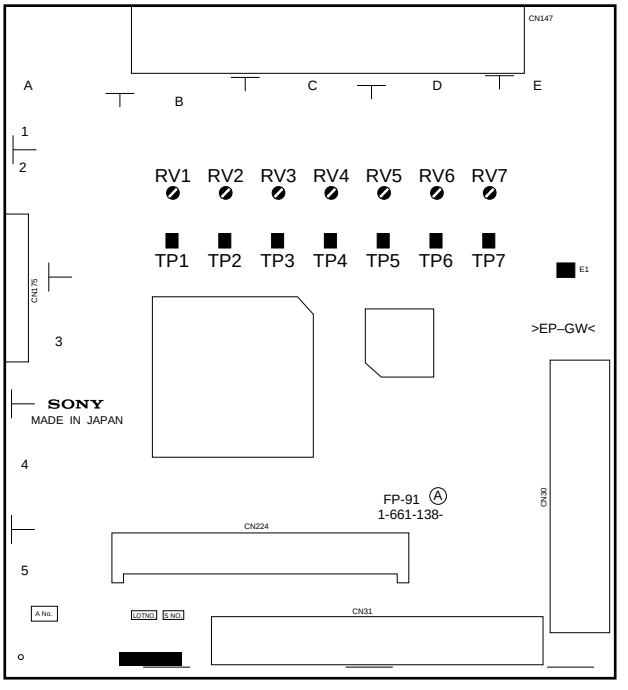
Adjustment without the Shorting Connector

Note

Be sure to short-circuit VIDEO CONTROL connector's pins in the power off.
Never short-circuit this connector's pin 7 (+12 V) or pin 15 (−12 V) to other pin.

1. Turn off the POWER switch.
2. Short-circuit VIDEO CONTROL connector's pin 8 (GND) to one of the satisfied pin on the table below.
3. Turn on the POWER switch.
4. Connect the digital voltmeter to the specified measurement point on the table below.
5. Adjust the voltage on the digital voltmeter.
   Adj. points: Refer to table below.
   Specification: 2.500 ±0.001 V dc
6. Repeat from step 1 until completing the adjustments for all adjustment points.

Pin No. to short-circuit [Adjusting item]	Measurement point	Adjustment point
1 [SYNC PHASE]	TP6/FP-91(D-2)	⊘RV6/FP-91(D-2)
2 [CHROMA PHASE]	TP5/FP-91(D-2)	⊘RV5/FP-91(D-2)
3 [SC PHASE]	TP7/FP-91(D-2)	⊘RV7/FP-91(D-2)
4 [VIDEO LEVEL]	TP1/FP-91(B-2)	⊘RV1/FP-91(B-2)
5 [SETUP(BLACK) LEVEL]	TP3/FP-91(C-2)	⊘RV3/FP-91(C-2)
6 [CHRAMA LEVEL]	TP2/FP-91(B-2)	⊘RV2/FP-91(B-2)
13 [Y/C DELAY]	TP4/FP-91(C-2)	⊘RV4/FP-91(D-2)



FP-91 Board (Side A)

Adjustment with the Shorting Connector

Note

Be sure to connect the shorting connector in the power off.

1. Turn off the POWER switch.
2. Connect the shorting connector to VIDEO CONTROL connector.
3. Turn on the POWER switch.
4. Adjust each voltage on the digital voltmeter.
   Measure. point: Refer to the table below.
   Adj. point: Refer to the table below.
   Specification: 2.500 ±0.001 V dc

Adjusting item	Measurement point	Adjustment point
VIDEO LEVEL	TP1/FP-91(B-2)	⊘RV1/FP-91(B-2)
CHRAMA LEVEL	TP2/FP-91(B-2)	⊘RV2/FP-91(B-2)
SETUP(BLACK) LEVEL	TP3/FP-91(C-2)	⊘RV3/FP-91(C-2)
Y/C DELAY	TP4/FP-91(C-2)	⊘RV4/FP-91(D-2)
CHROMA PHASE	TP5/FP-91(D-2)	⊘RV5/FP-91(D-2)
SYNC PHASE	TP6/FP-91(D-2)	⊘RV6/FP-91(D-2)
SC PHASE	TP7/FP-91(D-2)	⊘RV7/FP-91(D-2)

Perfection

1. Turn off the POWER switch.
2. Reinstall the audio level meter module.
   (Perform in the reverse steps 2 and 3 of "Preparation".)
   Notes
   - This module's displaying side is glass. Be sure to handle with care.
   - Fix the earth wire and this module (its left part) together .
3. Reattach the panel for the upper control panel.
4. When the shorting connector was used, remove it.

3-10. SDI/SDTI I/O Lines Adjustment (CP-297 Board)

3-10-1. Adjustment Overview

There are the lines of SDI input, SDI output, and SDTI output in the VTR.
For the DNW-A100/A100P only is applied the SDTI input* function by the optional kit (BKNW-103).
In these electrical adjustments, adjust each VCO free-running frequency for the decoders and encoders using the menu in the maintenance mode.

Line	Adjustment item
SDI output	VCO free-running freq. adj. for SDI encoder**
SDTI output	VCO free-running freq. adj. for SDTI encoder**
SDI input	VCO free-running freq. adj. for SDI decoder**
SDTI input*	VCO free-running freq. adj. for SDTI decoder

*: As to the electrical adjustment of the DNW-A100's SDTI input line, refer to Section "4-1. BKNW-103 (CP-300 Board)". In the electrical adjustment of the SDTI input line, adjust the potentiometer (RV100 on the CP-300 board).

**: Usually perform the automatic adjustment of Section 3-10-2. If the manually adjustment is needed, refer to Section 3-10-3.

Note

For detail of each menu in the maintenance mode, refer to Section 4 of the maintenance manual part 1.

Tools list

To perform the electrical adjustments for the SDI input/output and SDTI output, prepare the following equipment.

Note

Manually adjustment is not needed when the automatic adjustment can be is performed in the VTR.

When performing the automatic adjustment

- Analog composite video monitor

When performing the manually adjustment

- Oscilloscope: TEKTRONIX 2465B or equivalent
- Frequency counter: ADVANTEST TR5821AK or equivalent
- Analog composite video monitor

Note

This video monitor is for menu displaying. Be sure to connect it to VIDEO OUTPUT COMPOSITE 3 (SUPER) connector.

Adjustment Items

VCO free-running frequency adjustment	Adjustment point	Measurement point for manually adj.
For SDI encoder	A231: SDI ENC VCO	TP109/DIF-42
For SDTI encoder	A232: SDTI ENC VCO	TP109/DIF-42
For SDI decoder	A233: SDI DEC VCO	TP109/DIF-42
Data save	A2F: NV-RAM CONTROL	

Note

Since above adjustment items can be adjusted independently of each other, no special order has been observed.

3-10-2. VCO Free-running Frequency Automatic Adjustment

Preparing tool

- Analog composite video monitor

Note

This video monitor is for menu displaying. Be sure to connect it to VIDEO OUTPUT COMPOSITE 3 (SUPER) connector.

Preparation

1. Check the setting on the sub control panel.

CHARACTER switch ⇨ ON

2. Check that the VTR has warmed up.

Before starting the adjustment, warm up the VTR through the power for 10 minutes or more.

Automatic Adjustment

1. To enter the maintenance mode, press S1101(G-1) on the SS-63 board.
2. Enter A23 : CP VR in the maintenance mode.
3. Enter the following specified sub menu.
   For SDI output: A231 : SDI ENC VR
   For SDTI output: A232 : SDTI ENC VR
   For SDI input: A233 : SDI DEC VR

   Note

   In this time, the adjustment mode is the manual, and "Manual" is displayed on the video monitor.
   (In the time data display area of the VTR, "MANUAL" is displayed.)
4. Change the adjustment mode to the automatic.
   (Change the massage to "Auto (Push SET button)".)

   Note

   How to change the adjustment mode from the manual to the automatic:
   When there is the ∗-mark to ahead of "Manual", turn the search dial in FORWARD (↻) direction while pressing the JOG button.
   (In the time data display area, "PUSH SET" is displayed.)
5. To execute the automatic adjustment, press the SET button once on the lower control panel.
   - The displayed message on the video monitor changes to "Auto Adjusting ...". The displayed data value also changes.
     The display in the time data display area does not change. ("PUSH SET" in it remain displayed.)
6. Confirm the automatic adjustment completion on the video monitor.
   - Message "Auto Adjust Complete" is displayed when the automatic adjustment is completed.

   Note

   If message "Auto Adjust Failure" is displayed, refer to the "For Automatic Adjustment Failure" below.
7. To exit the sub menu, press the MENU button once on the lower control panel.

   Note

   Go to step 3 in order to perform other VCO free-running frequency adjustment.
8. To exit the menu of A23 : CP VR, press the MENU button once again.

Data save (store the adjusted data)

Note

Do not save the adjustment data if the automatic adjustments was not completed normally.

9. Enter A2F : NV-RAM CONTROL, then execute "SAVE ALL ADJUST DATA".
   - Message "Save Complete" is displayed on the video monitor when this data save is completed normally.

   Note

   When loading the previous data without save the current adjusted data, execute "ALL DATA PREVIOUS".
10. To exit the maintenance mode, press the MENU button four times.

For Automatic Adjustment Failure

Confirm that no abnormality exists in the harness and flat cable connecting the CP-297 board and MB-647 board.
If no abnormality is found in the connection, the CP-297 board or DIF-42 board is considered to be defective.

3-10-3. VCO Free-running Frequency Manually Adjustment

Preparing tools

- Oscilloscope: TEKTRONIX 2465B or equivalent
- Frequency counter: ADVANTEST TR5821AK or equivalent
- Analog composite video monitor

Note

This monitor is for menu displaying. Be sure to connect it to VIDEO OUTPUT COMPOSITE 3 (SUPER) connector.

Preparation

1. Check the setting on the sub control panel.
CHARACTER switch ⇨ ON

2. Check that the equipment has warmed up.
Before starting the adjustment, warm up the VTR and other equipment through the power for 10 minutes or more.

Manual Adjustment

1. Set and connect the oscilloscope as follows:
   CH-2: TP109/DIF-42(F-1), DC 2 V/DIV
   GND: E100/DIF-42(F-1)
   TIME: 100 µs/DIV
2. Connect the frequency counter's input to the oscilloscope's CH-2 output.
3. To enter the maintenance mode, press S1101(G-1) on the SS-63 board.
4. Enter A23 : CP VR of the maintenance mode.
5. Enter the following specified sub menu.
   For SDI output: A231 : SDI ENC VR
   For SDTI output: A232 : SDTI ENC VR
   For SDI input: A233 : SDI DEC VR

   Note

   In this time, the adjustment mode is the manual, and "Manual" is displayed on the video monitor. (In the time data display area of the VTR, "MANUAL" is displayed.)
6. Turn the search dial in FORWARD (↷) direction to move the ∗-mark to the line of the adjustment data . (Displays the item title in the time data display area, "SDI ENC" for example.)
7. Change the data until the indicated frequency on the frequency counter satisfy the specification .
   Specification: 27.00 ±0.10 MHz

   Note

   How to change the adjustment data:
   Turn the search dial while pressing the JOG button.
8. To exit the sub menu, press the MENU button once on the lower control panel.

   Note

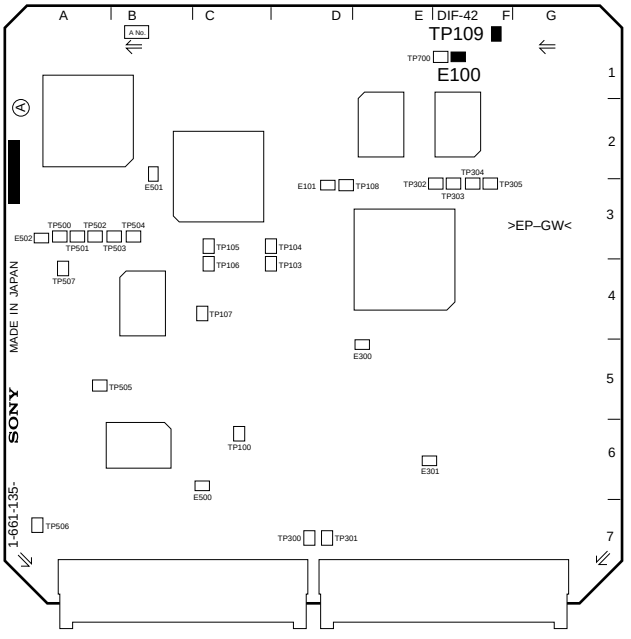
   Go to step 5 in order to perform other VCO free-running frequency adjustment.
9. To exit the menu of A23 : CP VR, press the MENU button once again.

Data save (store the adjusted data)

10. Enter A2F : NV-RAM CONTROL, then execute "SAVE ALL ADJUST DATA".
    - Message "Save Complete" is displayed on the video monitor when this data save is completed normally.

    Note

    When loading the previous data without save the current adjusted data, execute "ALL DATA PREVIOUS".
11. To exit the maintenance mode, press the MENU button four times.



DIF-42 Board (Side A)

3-11. LTC Alignment and Full Erasure Current Check (TC-96 Board)

3-11-1. Adjustment Overview

When the TC-96 board is repaired or replaced, perform the time code system alignment.

Tools List

To perform the time code system alignment for the VTR, prepare the following equipment and fixtures.

- Oscilloscope: TEKTRONIX 2465B or equivalent
- Audio level meter: HEWLETT-PACKARD HP3400A or equivalent
- Alignment tapes: SR5-1 (Part No. 9-960-075-01) or
  SR5-1P (Part No. 9-960-075-51)

Note

Prepare either SR5-1 (for 525/60 system) or SR5-1P (for 625/50 system) in accordance with the operation system to be adjusted.

- Recording tape: BCT-SX series (Betacam SX cassette)
  (Sony's standard products)

Note

For this recording tape, prepare the virgin tape or no recorded tape that erased using the tape eraser, etc. in advance.

Adjustment Items

Section	Item (Section title)	Adjustment point	Measurement point
3-11-2	LTC playback level check	—	TP102/TC-96(A-2)
3-11-3	LTC recording level check	—	TP100/TC-96(A-3), TP101/TC-96(A-2)
3-11-4	Full erasure current check	—	TP201/TC-96(B-1), TP200/TC-96(B-1)
3-11-5	LTC erasure current adjustment	⊘LV300/TC-96(A-1)	TP301/TC-96(B-1), TP300/TC-96(B-1)

Common Preparation

Perform the settings of control panels' switch, before starting the adjustments.
Return the all settings to the customer settings after completing the alignment.

Part	Item		Customer setting	Setting at adjustment
Upper control panel	TC:	LTC/AUTO/VISC	_____	⇨ LTC
	TC GENERATOR:	INT/EXT	_____	⇨ INT
		PRESET/REGEN	_____	⇨ REGEN
		REC RUN/REC RUN	_____	⇨ REC RUN
	REMOTE/LOCAL selection		_____	⇨ LOCAL (9P: unlit)
Sub control panel	REC INHIBIT switch		_____	⇨ OFF
	KEY INHIBIT switch		_____	⇨ OFF

3-11-2. LTC Playback Level Check

Preparing tools

- Oscilloscope: TEKTRONIX 2465B or equivalent
- Alignment tapes: SR5-1 (Part No. 9-960-075-01) or SR5-1P (Part No. 9-960-075-51)

Note

Prepare either SR5-2 (for 525/60 system) or SR5-1P (for 625/50 system) in accordance with the operation system to be adjusted.

Preparation

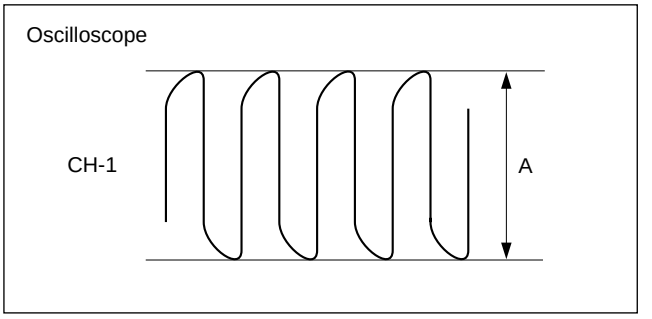
1. Check the setting on the upper control panel.
REMOTE/LOCAL ⇨ LOCAL (9P: unlit)

2. Check the setting on the sub control panel.
KEY INHIBIT switch ⇨ OFF

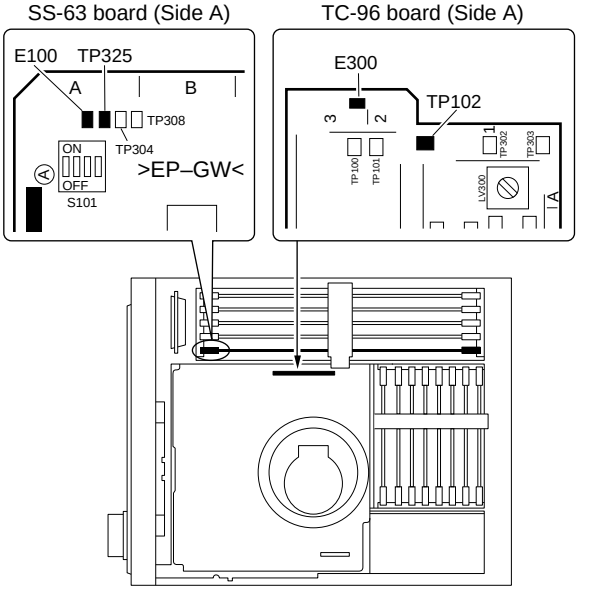
3. Check that the equipment has warmed up.
Before starting the adjustment, warm up the VTR and oscilloscope through the power for 10 minutes or more.

Playback Level Check

1. Set and connect the oscilloscope as follows:
   CH-1: TP102/TC-96(A-2), DC 100 mV/DIV
   GND: E300/TC-96 (A-3)
   TIRG: TP325/SS-63(A-1), GND: E100/SS-63(A-1)
   TIME: 100 μs/DIV
2. Insert the alignment tape SR5-1 or SR5-1P.
3. During play back the alignment tape in the following PB modes, check each level on the oscilloscope.
   PB modes: PLAY
   REW
   SHUTTLE (−5 times speed)
   SHUTTLE (−0.21 time speed)
   Specification: A ≧ 200 mV p-p (in each PB mode)



4. Eject the alignment tape.



3-11-3. LTC Recording Level Check

Preparing tools

- Oscilloscope: TEKTRONIX 2465B or equivalent
- Recording tape: BCT-SX series (Betacam SX cassette) (Sony's standard products)

Note

For this recording tape, prepare the virgin tape or no recorded tape that erased using the tape eraser, etc. in advance.

Preparation

1. Check the settings on the upper control panel.

LTC/AUTO/VISC ⇨ LTC
INT/EXT ⇨ INT
PRESET/REGEN ⇨ REGEN
FREE RUN/REC RUN ⇨ REC RUN
REMOTE/LOCAL ⇨ LOCAL (9P: unlit)

2. Check the settings on the sub control panel.

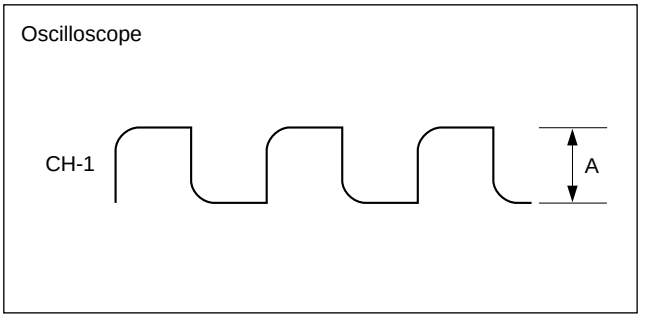
KEY INHIBIT switch ⇨ OFF
REC INHIBIT switch ⇨ OFF

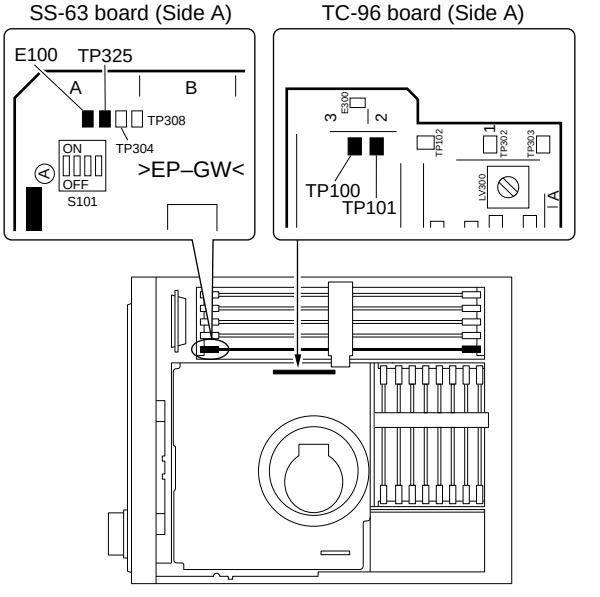
3. Check that the equipment has warmed up.

Before starting the adjustment, warm up the VTR and oscilloscope through the power for 10 minutes or more.

Recording Level Check

1. Set and connect the oscilloscope as follows:
   CH-1: TP100/TC-96(A-2), DC 100 mV/DIV
   GND: TP101/TC-96(A-3)
   TIRG: TP325/SS-63(A-1), GND: E100/SS-63(A-1)
   TIME: 100 µs/DIV
2. Insert the recording tape.
3. Check the level on the oscilloscope in recording on the tape.
   Specification: A = 60 ± 5 mV p-p





3-11-4. Full Erasure Current Check

Preparing tools

- Audio level meter:
  HEWLETT-PACKARD HP3400A or equivalent
- Recording tape: BCT-SX series (Betacam SX cassette)
  (Sony's standard products)

Note

For this recording tape, prepare the virgin tape or no recorded tape that erased using the tape eraser, etc. in advence.

Preparation

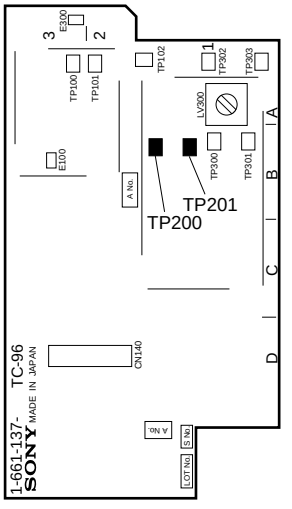
1. Check the setting on the upper control panel.
REMOTE/LOCAL ⇨ LOCAL (9P: unlit)

2. Check the settings on the sub control panel.
KEY INHIBIT switch ⇨ OFF
REC INHIBIT switch ⇨ OFF

3. Check that the equipment has warmed up.
Before starting the adjustment, warm up the VTR and audio level meter through the power for 10 minutes or more.

Full Erase Bias Current Check

1. Connect the audio level meter (V rms measurement mode) to TP201(B-1) on the TC-96 board.
   GND: TP200/TC-96(B-3)
2. Insert the recording tape.
3. Check the level on the audio level meter in recording on the tape.
   Specification: 120 mV rms or more
   (Note: 40.5 ± 1.0 kHz)



TC-96 Board (Side A)

3-11-5. LTC Erasure Current Check

Preparing tools

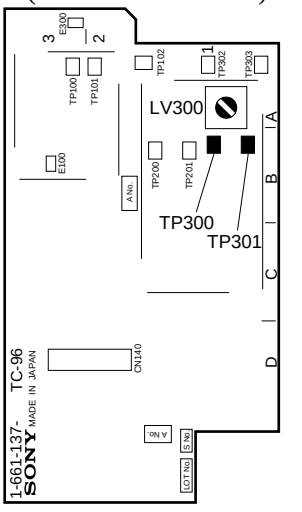
The same as Section 3-11-4

Preparation

The same as Section 3-11-4

Time Code Erase Bias Current Check

1. Connect the audio level meter (V rms measurement mode) to TP301(B-1) on the TC-96 board.
   GND: TP300/TC-96(B-1)
2. Insert the recording tape.
3. Check the level on the audio level meter in recording on the tape.
   Adj. point: ⊘LV300/TC-96(A-1)
   Specification: Maximum (110 mV rms or more: OK)
   (Note: 40.5 ± 1.0 kHz)



TC-96 Board (Side A)

http://getMANUAL.com

Section 4
Electrical Alignment for Optional Boards

This section describes the electrical alignment which is required after the maintenance of the optional boards. Reinstall the optional boards, then adjust. Refer to the maintenance manual part 1 for installing the optional boards
Moreover some adjustments have to operate the maintenance mode. In this case, refer to the followings for the operation.

Operation Method of Maintenance Mode

1. How to Enter the Maintenance Mode

Push S1101 on the SS-63 board.

2. How to Enter the Next Menu

(1) Push the JOG button once. =Search dial enters JOG mode.
(2) Turn the search dial and set the ∗mark to a desired menu (mode).
(3) Push the SET button.

3. How to Exit the Current Menu (Mode)

Push the MENU button.

Note

If the MENU button is pushed several times, the maintenance mode exits.

4. How to Change the Data Value

(1) Turn the search dial and set the ∗mark to the item to adjust.
(2) Turn the search dial while pressing the JOG button.
REVERSE direction: decrease the data value
FORWARD direction: increase the data value

Note

During adjustment, change the rotational direction of the search dial according to the change of wave form or value that is displayed on the measuring equipment.

5. When Change the Setting

Turn the search dial while pressing the JOG button to display the desired setting.

6. How to Save the Data

(1) Turn the search dial and set the ∗mark to A2F: NV-RAM CONTROL.
(2) Push the SET button.
(3) Turn the search dial and set the ∗mark to “SAVE ALL ADJUST DATA”
(4) Push the SET button.

4-1. DEC-65 Board (BKDW-505/506)

4-1-1. Adjustment

Items of Adjustment

No.	Item		Adjustment point	Notes
1.	Pedestal level adjustment			
	For board suffix No.-12 and higher:		⊘RV300 (DEC-65 board)	VIDEO OUTPUT COMPOSITE 2
	For board suffix No.-11:		⊘RV2 (DUS-722 board)	
2.	Pedestal detect timing adjustment (For board suffix No.-11 only)			
			⊘RV1 (DUS-722 board)	Pin 7 of IC203
3.	Analog composite input level (MANUAL) adjustment			
			A26: DEC VR (LOOP):VIDEO GAIN	VIDEO OUTPUT COMPOSITE 2
		Data save	A2F: NV-RAM COMTROL	
4.	Analog composite input frequency response adjustment			
			A26: DEC VR (LOOP):VIDEOFREQ COMP	VIDEO OUTPUT COMPOSITE 2
		Data save	A2F: NV-RAM COMTROL	
5.	Analog composite input level (AGC) adjustment			
			A25: DEC VR:AGC VIDEO GAIN	VIDEO OUTPUT COMPOSITE 2
		Data save	A2F: NV-RAM COMTROL	
6.	Pedestal level check		Check	VIDEO OUTPUT COMPOSITE 2
7.	Composite Input color frame detect adjustment			
			A24: INPUT CF DETECT	VIDEO OUTPUT COMPOSITE 2
		Data save	A2F: NV-RAM COMTROL	

Equipment

BKDW-505 (For DNW-A100/A50/A45)

Oscilloscope (TEKTRONIX 2465B or equivalent)
Analog composite signal generator (TEKTRONIX TSG-170A or equivalent)
NTSC waveform/vector monitor (TEKTRONIX 1750 or equivalent)
Video monitor
Extension board EX-377: Part No.J-6269-810-A (Board suffix of the DEC-65 board is -11 only.)

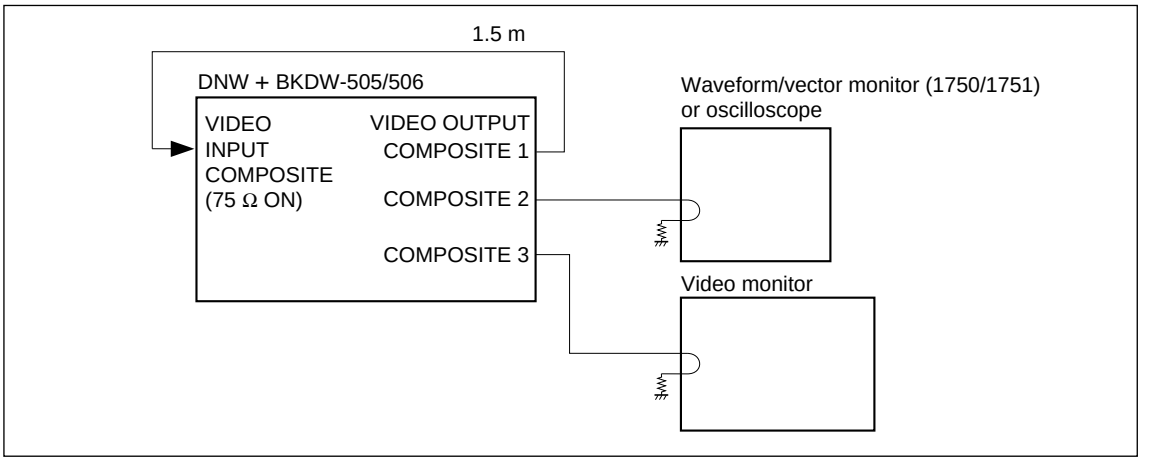
BKDW-506 (For DNW-A100P/A50P/A45P)

Oscilloscope (TEKTRONIX 2465B or equivalent)
Analog composite signal generator (TEKTRONIX TSG-271 or equivalent)
Waveform/vector monitor (TEKTRONIX 1751 or equivalent)
Video monitor
Extension board EX-377: Part No.J-6269-810-A (Board suffix of the DEC-65 board is -11 only.)

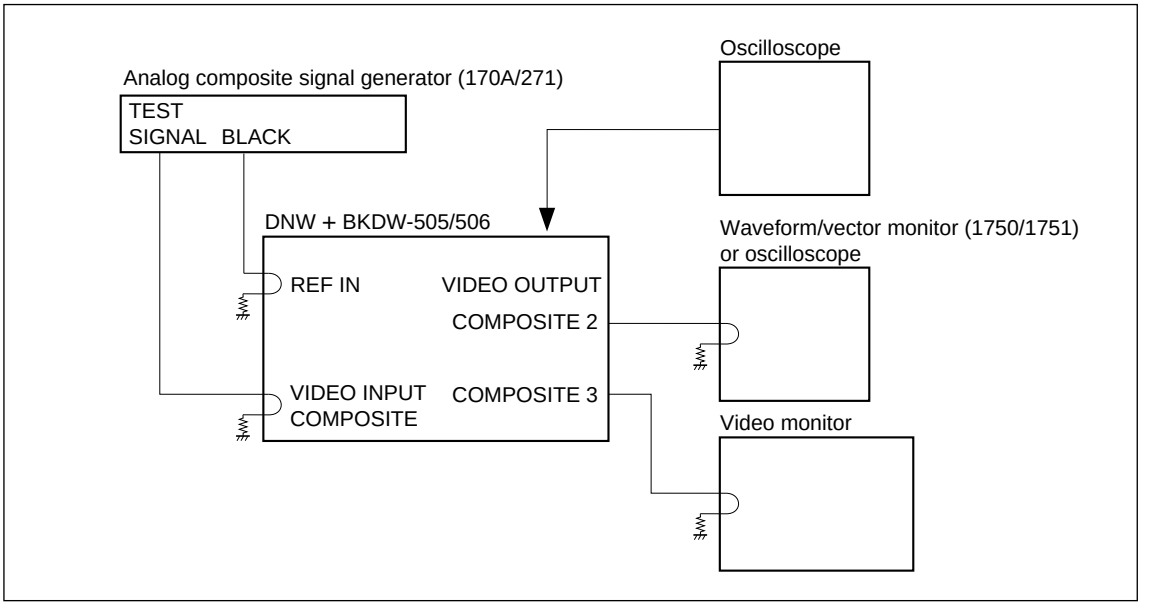
Connection

Connect the equipment described at the previous page as shown below depending on the items of adjustment.

Connection 1

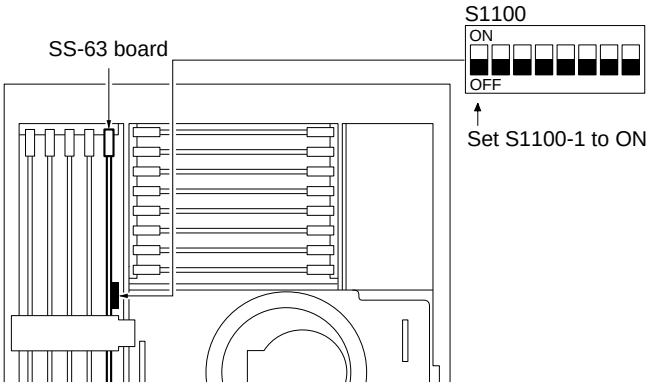


Connection 2



Setting of Unit Side

1. Turn on the power.
2. Set S1100-1 on the SS-63 board to ON (CLOSE) to treat the extended menu.



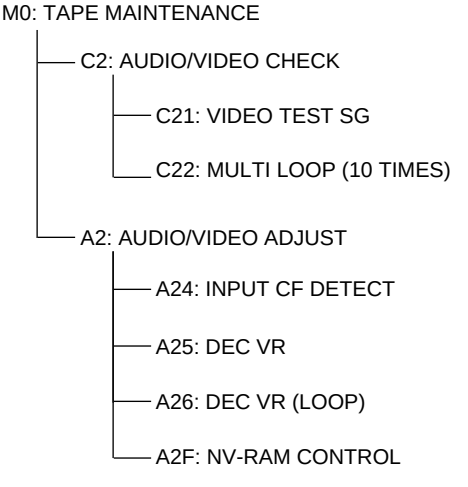
3. Set the setup extended menu.
   • For BKDW-505
   Set the ITEM-713 as follows.

ITEM	SUB-ITEM	Setting	Previous setting (fill up)
713: VIDEO SETUP REFERENCE LEVEL	0.MASTER LEVEL	0.0 %	
	1. INPUT LEVEL	MSTER	
	2. V BLK REMOVE CNT	REMOV	
	3. BETACAM PB LEVEL	MSTER	
	4. OUTPUT LEVEL	MSTER	

   • For BKDW-506
   None.

Note

The sub mode and menu of the maintenance mode that is used in Section 4-1 is as shown below.



1. Pedestal level Adjustment

(1) Connect as connection 2.

Note

When the board suffix No.is -11, it is required to extend the DEC-65 board with the extension board. Wait for 30 seconds after turning off the power, then perform the extension.

(2) Input the lamp signal from the signal generator.

(3) Observe the burst signal portion of VIDEO OUTPUT COMPOSITE 2 output with the waveform monitor or oscilloscope.

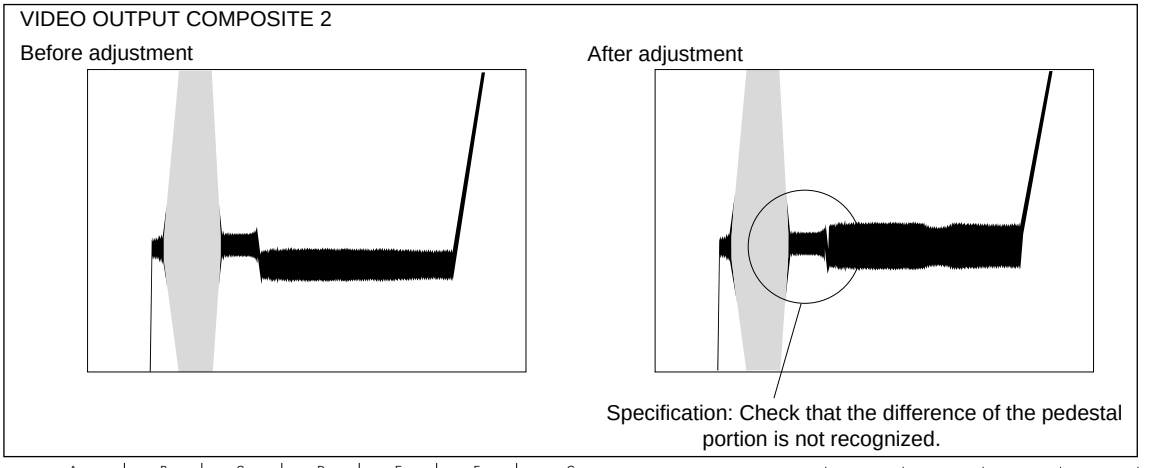
Setting of measurement equipment

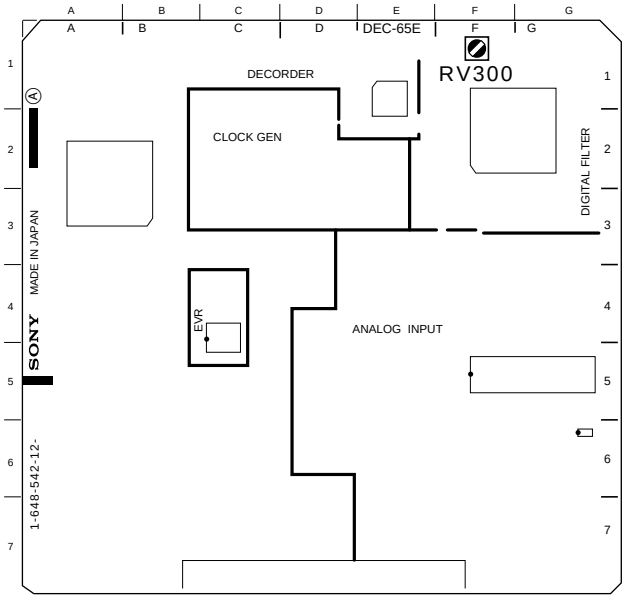
- Waveform monitor
  SWEEP: 1 H, MAG
  GAIN: ×5
  UNCAL: MAX
- Oscilloscope
  CH-1: DC 0.5 mV/DIV, 2 µs/DIV
  Band-width limit: ON

(4) Adjust that the waveform of the pedestal portion satisfies the specification.

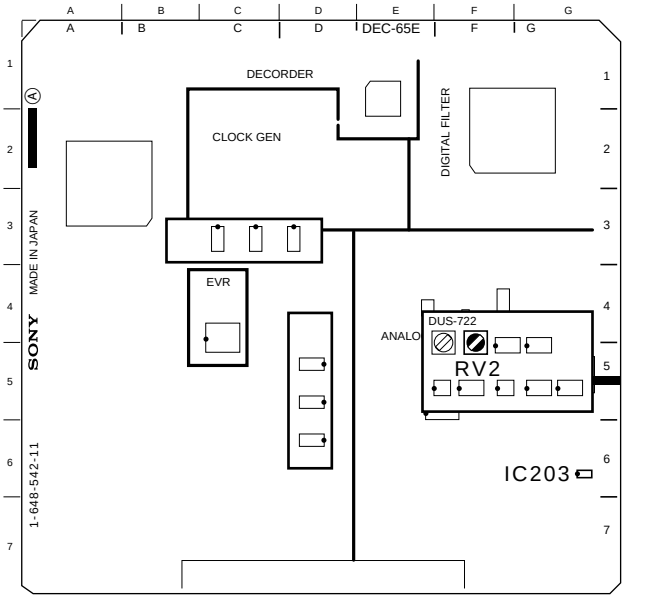
Board suffix No. is -12 and higher: Adjust ⊘RV300 on the DEC-65 board.

Board suffix No. is -11: Adjust ⊘RV2 on the DUS-722 board.


VIDEO OUTPUT COMPOSITE 2
Before adjustment
After adjustment
Specification: Check that the difference of the pedestal portion is not recognized.



Suffix No. -12 and higher



Suffix No. -11

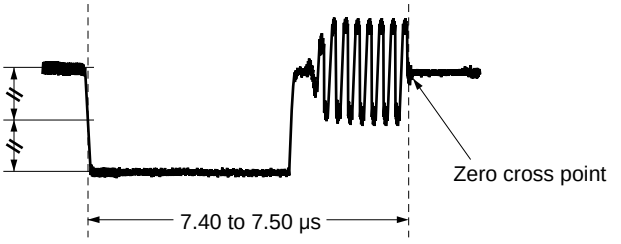
2. Pedestal Detect Timing Adjustment (For board suffix No.-11 only)

Perform this adjustment only when the board suffix No. of the DEC-65 board is -11.

(1) Connect as connection 2.
(2) Observe pin 7 of IC203 (G-6) with the oscilloscope.
- Oscilloscope setting
  CH-1: DC 200 mV/DIV, 1 µs/DIV
  Band-width limit: ON

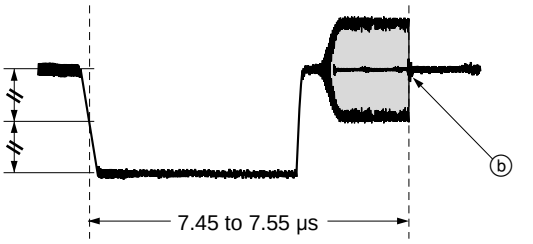
(3) Adjust ⊘RV1 on the DUS-722 board that the pedestal detect timing satisfies the specifications.

For BKDW-505

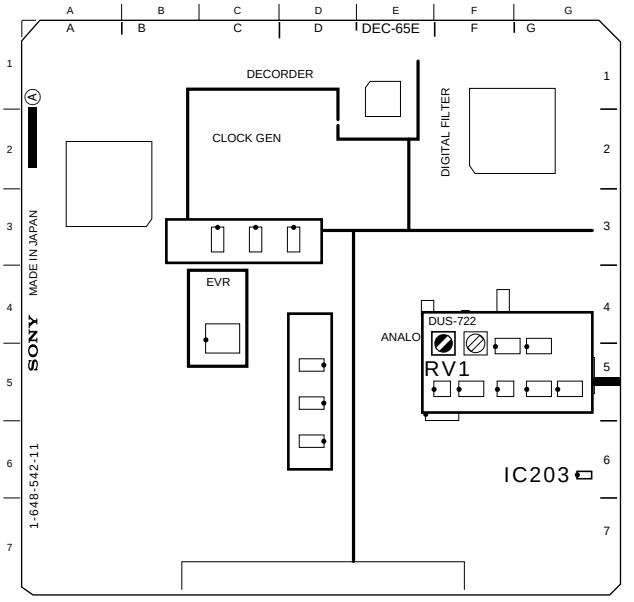


Specification: Adjust the end of the burst signal to the zero cross point within 7.40 to 7.50 µs.

For BKDW-506



Specification: Adjust the end of the burst signal within 7.45 to 7.55 µs.



3. Analog Composite Input Level (MANUAL) Adjustment

(1) Connect as connection 1.
(2) Push S1101 on the SS-63 board so as to enter the maintenance mode.
(3) Select A26: DEC VR (LOOP) of A2: AUDIO/VIDEO ADJUST of the maintenance mode.
(4) Select “VIDEO GAIN”.

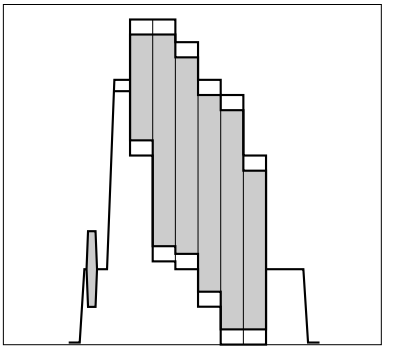
Note

100% color bar signal is output from the video test signal generator in this unit.

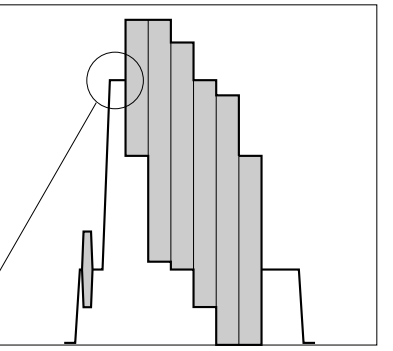
(5) Adjust “VIDEO GAIN” that the specification is satisfied.

VIDEO OUTPUT COMPOSITE 2

Before adjustment



After adjustment



Specification: The white level of the signal after looping overlaps on the 1st signal.

Supplement The signal after looping is displaied in a state of overlapping on 1st signal on the screen of the waveform monitor. They appear that the 1st signal is freezing and the signal after looping is changing the fluctuation level.

(6) After completing the adjustment, push the MENU button once so as to exit A26: DEC VR (LOOP).
(7) Select A2F: NV-RAM CONTROL and save the adjusted data in NV-RAM (execute “SAVE ALL ADJUST DATA”).
(8) Check that the message “Save Complete” is displayed on the video monitor screen.
(9) Push the MENU button once so as to exit A2F: NV-RAM CONTROL.

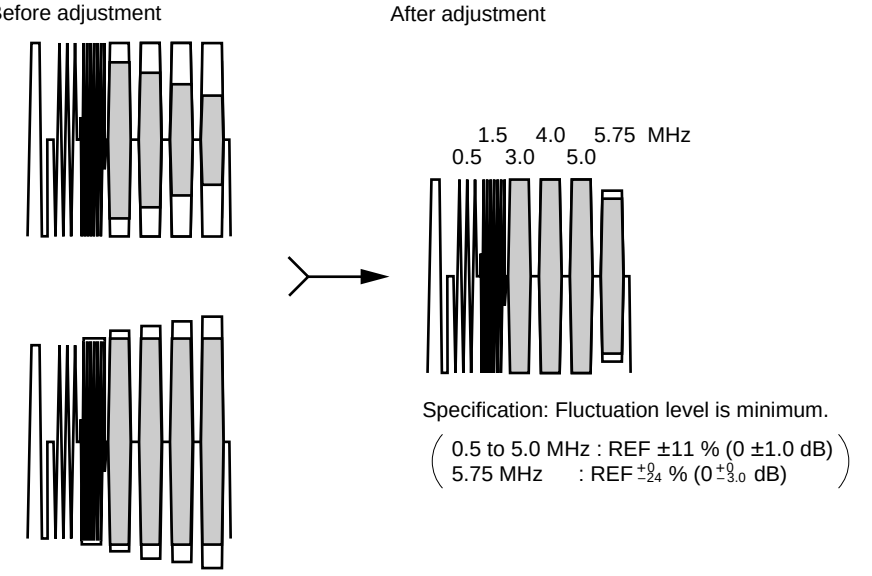
4. Analog Composite Input Frequency Response Adjustment

(1) Connect as connection 1.
(2) Select A26: DEC VR (LOOP) of A2: AUDIO/VIDEO ADJUST of the maintenance mode.
(3) Select “VIDEO FREQ COMP”.

Note

The MULTI burst signal is output from the video test signal generator in this unit.

(4) Adjust “VIDEO FREQ COMP” that the fluctuation level of VIDEO OUTPUT COMPOSITE 2 output signal is minimum.
(5) Regard 1st signal of each frequency as 100%(REF), then check that the level of signal after looping satisfies the specifications.


Before adjustment
After adjustment
1.5 4.0 5.75 MHz
0.5 3.0 5.0
Specification: Fluctuation level is minimum.
0.5 to 5.0 MHz : REF ±11 % (0 ±1.0 dB)
5.75 MHz : REF +0 −24 % (0 +0 −3.0 dB)

Supplement The signal after looping is displaied in a state of overlapping on 1st signal on the screen of the waveform monitor. They appear that the 1st signal is freezing and the signal after looping is changing the fluctuation level.

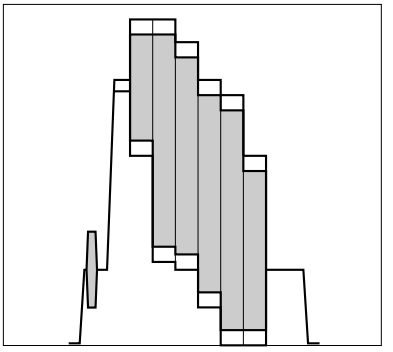
(6) After completing the adjustment, push the MENU button once so as to exit A26: DEC VR (LOOP).
(7) Select A2F: NV-RAM CONTROL and save the adjusted data in NV-RAM (execute “SAVE ALL ADJUST DATA”).
(8) Check that the message “Save Complete” is displayed on the video monitor screen.
(9) Push the MENU button once so as to exit A2F: NV-RAM CONTROL.

5. Analog Composite Input Level (AGC) Adjustment

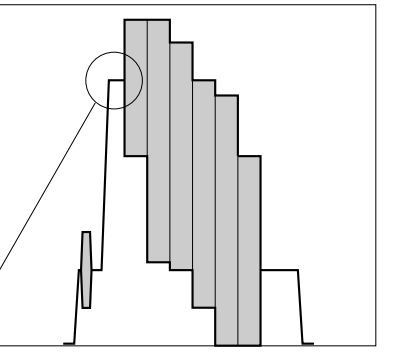
(1) Connect as connection 1.
(2) Select C22: MULTI LOOP (10 TIMES) of C2: AUDIO/VIDEO CHECK of the maintenance mode.
(3) Set the test signal to “100% Color Bars”.
(4) Push MENU button once so as to exit C22: MULTI LOOP (10 TIMES).
(5) Select A25: DEC VR of A2: AUDIO/VIDEO ADJUST.
(6) Select “AGC VIDEO GAIN”.
(7) Adjust “AGC VIDEO GAIN” that the specification is satisfied.

VIDEO OUTPUT COMPOSITE 2

Before adjustment



After adjustment



Specification: The white level of the signal after looping overlaps on the 1st signal.

Supplement The signal after looping is displaied in a state of overlapping on 1st signal on the screen of the waveform monitor. They appear that the 1st signal is freezing and the signal after looping is changing the fluctuation level.

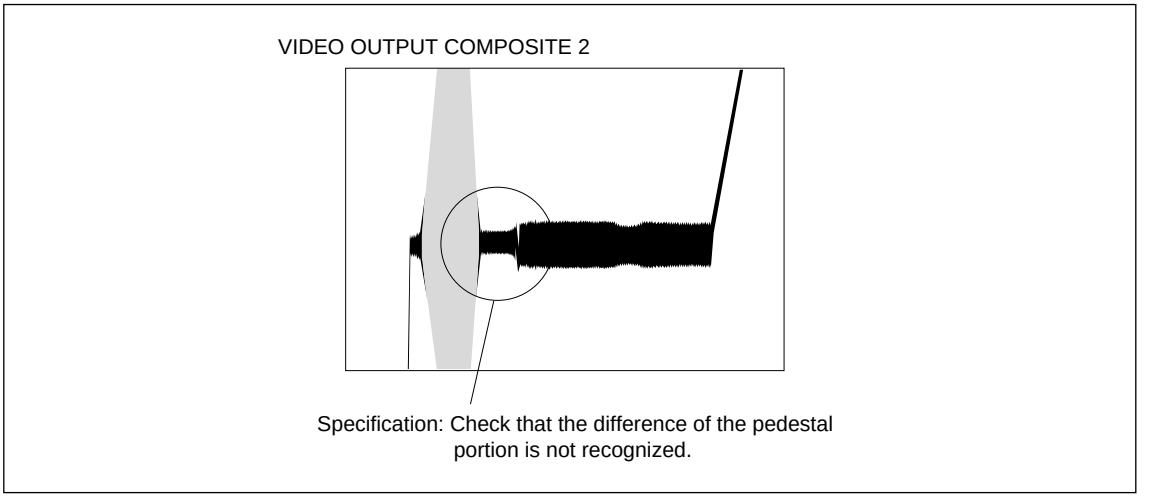
(8) After completing the adjustment, push the MENU button once so as to exit A25: DEC VR.
(9) Select A2F: NV-RAM CONTROL and save the adjusted data in NV-RAM (execute “SAVE ALL ADJUST DATA”).
(10) Check that the message “Save Complete” is displayed on the video monitor screen.
(11) Push the MENU button once so as to exit A2F: NV-RAM CONTROL.

6. Pedestal Level Check

Perform this check after completing the “5. Analog Composite Input Level (AGC) Adjustment”.

(1) Connect as connection 2.
(2) Select C21:VIDEO TEST SG of C2:AUDIO/VIDEO CHECK of the maintenance mode.
(3) Set TEST SG output to “Lamp”.
(4) Observe the burst signal portion of VIDEO OUTPUT COMPOSITE 2 output with the waveform monitor or oscilloscope.
Setting of measurement equipment
- Waveform monitor
  SWEEP: 1 H, MAG
  GAIN: ×5
  UNCAL: MAX
- Oscilloscope
  CH-1: DC 0.5 mV/DIV, 2 µs/DIV
  Band-width limit: ON

(5) Check that the waveform of the pedestal portion satisfies the specification.



(5) When the specification is not satisfied, perform “1. Pedestal Level Adjustment” of Section 4-4-1. Adjustment again.

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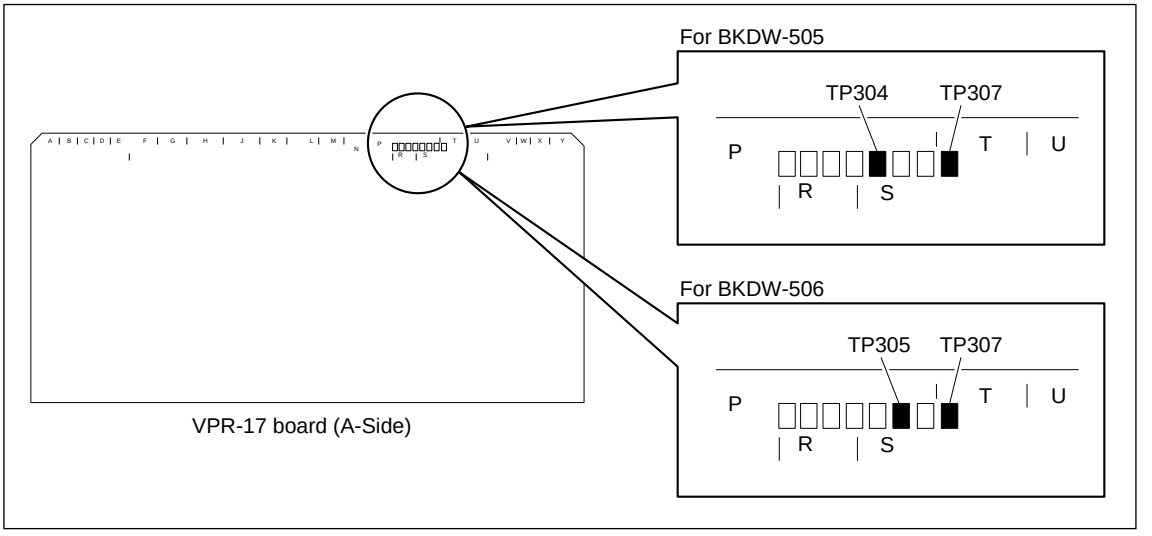
7. Composite Input Color Frame Detect Adjustment

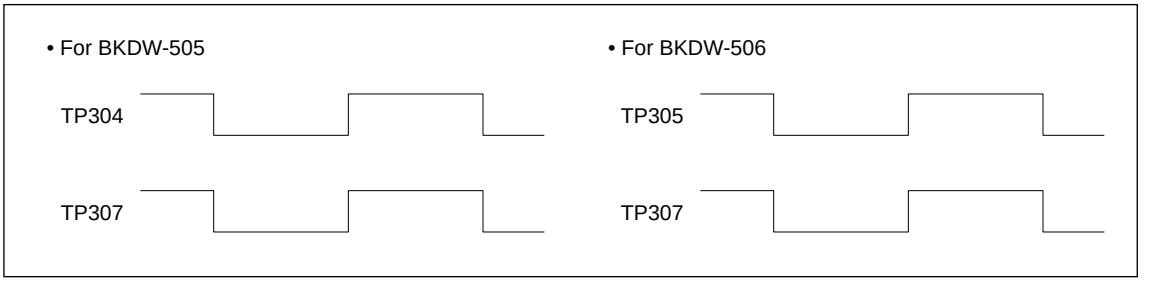
Note

Check that the video output SCH from the test signal generator is within 0 ±5°.

(1) Connect as connection 2.
(2) Select A24: INPUT CF DETECT of A2: AUDIO/VIDEO ADJUST of the maintenance mode.
(3) Set to “AUTO”. = Push SET button so as to execute the auto adjustment.
(4) Check that the message “Adjust Complete” is displayed on the video monitor screen after completing the adjustment.
(5) Observe the waveforms of TPs on the VPR-17 board with the oscilloscope.
- For BKDW-505
  Observe TP304 (S-1) and TP307 (T-1).
  Oscilloscope setting: TIME: 10 ms/DIV
- For BKDW-506
  Observe TP305 (S-1) and TP307 (T-1).
  Oscilloscope setting: TIME: 20 ms/DIV



(6) Check that the waveforms of TPs are in phase.



(7) Push the MENU button so as to exit A24: INPUT CF DETECT.
(8) Select A2F: NV-RAM CONTROL and save the adjusted data in NV-RAM (execute “SAVE ALL ADJUST DATA”).
(9) Check that the message “Save Complete” is displayed on the video monitor screen.
(10) Push the MENU button four times so as to exit the maintenance mode.

4-2. CP-300 Board (BKNW-103)

4-2-1. Adjustment

Item of Adjustment

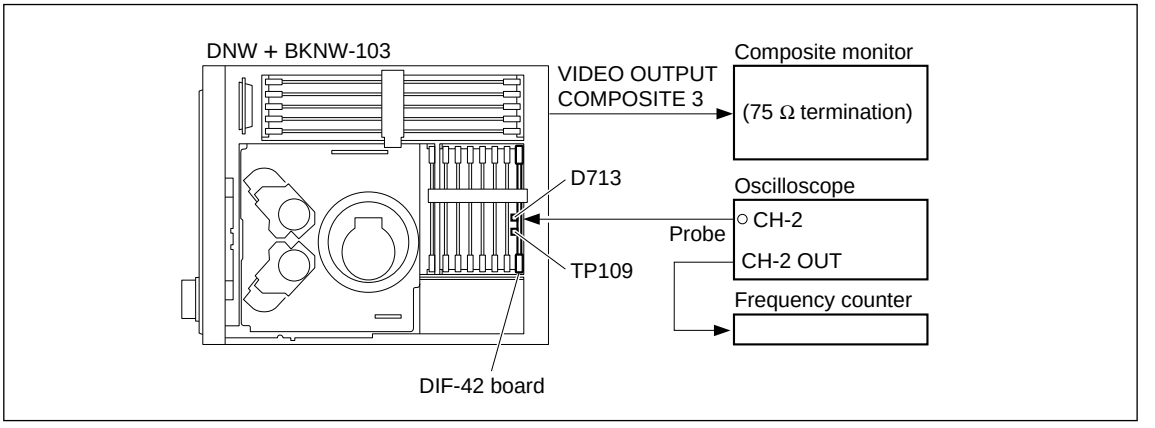
No.	Item	Adjustment point	Notes
1	Free run frequency adjustment	⊘RV100/CP-300	TP109/DIF-42 board

Equipment

Oscilloscope
Frequency counter
Composite monitor

Connection

Connect the equipment described above as shown below.



Setting of Unit Side

Turn on the power.

1. Free Run Frequency Adjustment

Refer to 4-1 page for the operation method of the maintenance mode when checking.

Note

Wait more than 10 minutes after turning power on, then start the adjustment.

Note

The sub mode and menu of the maintenance mode that is used in Section 4-2 is as shown below.

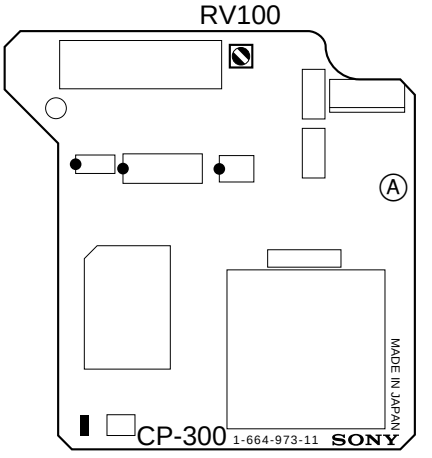
M0: TAPE MAINTENANCE
- A2: AUDIO/VIDEO ADJUST
  - A23: CP VR
    - A234: SDDI DEC VR

(1) Push S1101 on the SS-63 board so as to enter the maintenance mode.
(2) Select A234: SDTI DEC VR of the maintenance mode.
(3) Adjust ⊘RV100 on the CP-300 board temporarily that D713 (VCO ADJ) on the DIF-42 board illuminates or the VCO STATUS on the menu screen becomes “1”.

Note

Perform this temporary adjustment if the frequency counter can not be prepared.

(4) Fine adjust ⊘RV100 on the CP-300 board with the frequency counter that the specification is satisfied.
Specification: 27.0 ± 0.1 MHz



(5) Wait for 10 minutes under power on state.
(6) Check the value of the frequency counter satisfies the specification.
(7) Push the MENU button four times so as to exit the maintenance mode.
(8) Perform the operation check referring to the next page.

4-2-2. Operation Check

Equipment

BNC cable
Pre-recorded tape or Alignment tape*
*: SR5-1 (For 525/60 system)
SR5-1P (For 625/50 system)

Check

Note
Check that the EXT button on the lower control panel illuminates.

(1) Connect the BNC cable between the SDTI INPUT on the connector panel and the SDTI OUTPUT (1 or 2).
(2) Set the OUT REF switch on the sub control panel to REF.
(3) Insert the pre-recorded tape or alignment tape, and play back.
(4) Select the SDTI by the VIDEO INPUT SELECT switch on the upper control panel.
(5) Check that the SDTI indicator illuminates.
Note
If the SDTI indicator does not illuminate or blinks, check that the harnesses or cables are connected accurately.
(6) Eject the tape.
(7) Reset the OUT REF switch on the sub control panel to its previous state.
(8) Disconnect the BNC cable.

4-3. AD-105 Board (BKNW-104)

4-3-1. Adjustment

Items of Check and Adjustment

No.	Item		Adjustment point	Notes
1	Component video output level check			
		Y	——	VIDEO OUTPUT COMPONENT Y
		R-Y	——	VIDEO OUTPUT COMPONENT R-Y
		B-Y	——	VIDEO OUTPUT COMPONENT B-Y
2	Component video Betacam output level check (In 525/60 system)			
		Y	——	VIDEO OUTPUT COMPONENT Y
		R-Y	——	VIDEO OUTPUT COMPONENT R-Y
		B-Y	——	VIDEO OUTPUT COMPONENT B-Y
3	Component video output phase check			
			——	VIDEO OUTPUT COMPONENT
4	Component video input level adjustment			
		Y	A22: AD VR(LOOP): Y INPUT LEVEL	VIDEO OUTPUT COMPONENT Y
		R-Y	A22: AD VR(LOOP): R-Y INPUT LEVEL	VIDEO OUTPUT COMPONENT R-Y
		B-Y	A22: AD VR(LOOP): B-Y INPUT LEVEL	VIDEO OUTPUT COMPONENT B-Y
		Data save	A2F: NV-RAM CONTROL	
5	Component video input phase adjustment			
		Y	A22: AD VR(LOOP): Y INPUT PHASE	VIDEO OUTPUT COMPONENT Y
		R-Y	A22: AD VR(LOOP): Y/R-Y INPUT DELAY	VIDEO OUTPUT COMPONENT Y/R-Y
		B-Y	A22: AD VR(LOOP): Y/B-Y INPUT DELAY	VIDEO OUTPUT COMPONENT Y/B-Y
		Data save	A2F: NV-RAM CONTROL	
6	Component video Betacam input level adjustment (In 525/60 system)			
		Y	A22: AD VR(LOOP): B-CAM Y IN LEVEL	VIDEO OUTPUT COMPONENT Y
		R-Y	A22: AD VR(LOOP): B-CAM R-Y IN LEVEL	VIDEO OUTPUT COMPONENT R-Y
		B-Y	A22: AD VR(LOOP): B-CAM B-Y IN LEVEL	VIDEO OUTPUT COMPONENT B-Y
		Data save	A2F: NV-RAM CONTROL	
7	Component video input frequency response adjustment			
		Y	A22: AD VR(LOOP): Y FREQ COMP	SDI OUTPUT
		R-Y	A22: AD VR(LOOP): R-Y FREQ COMP	SDI OUTPUT
		B-Y	A22: AD VR(LOOP): B-Y FREQ COMP	SDI OUTPUT
		Data save	A2F: NV-RAM CONTROL	
8	Component video Betacam level check and adjustment (In 625/50 system)			

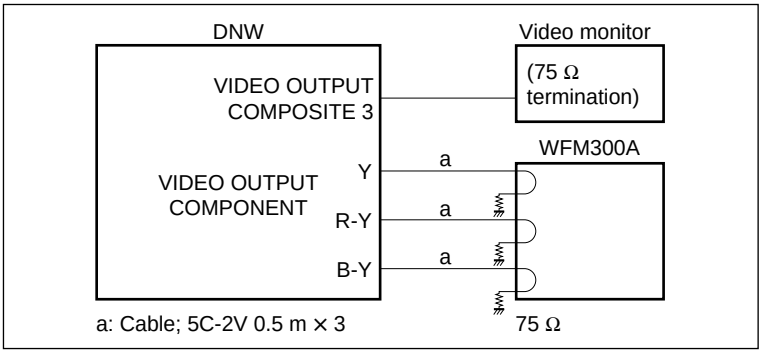
Equipment

Component waveform monitor (TEKTRONIX WFM300A or equivalent)
Serial component waveform monitor (TEKTRONIX WFM601i or equivalent)
Video monitor
75 Ω terminator (3 pcs.)

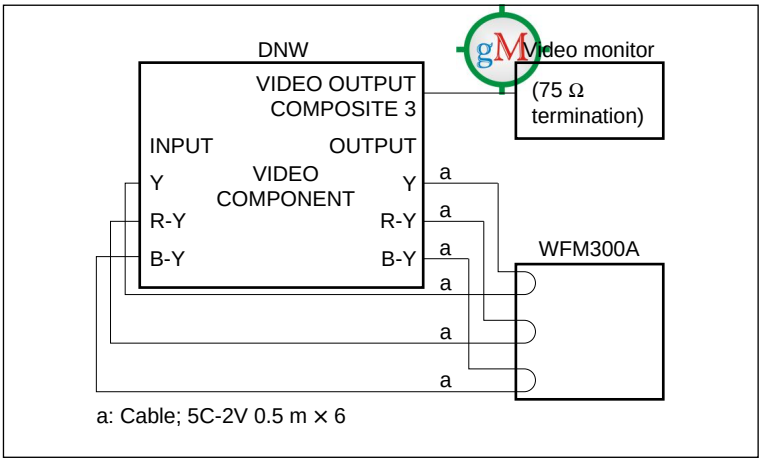
Connection

Connect the equipment described above as shown below depending on the items of adjustment.

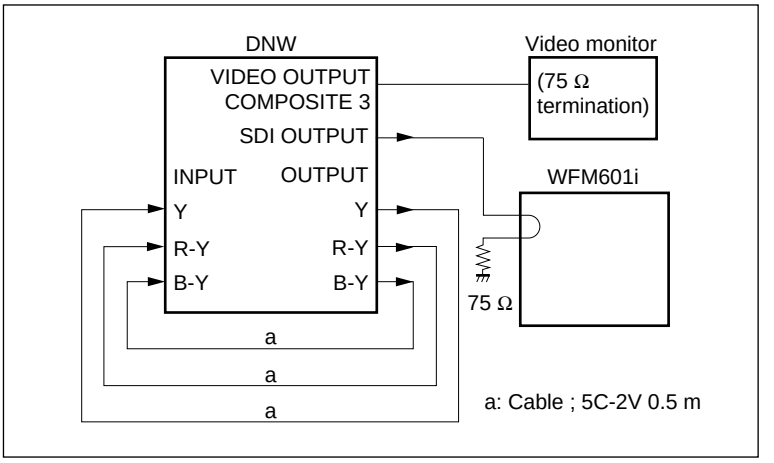
Connection 1



Connection 2



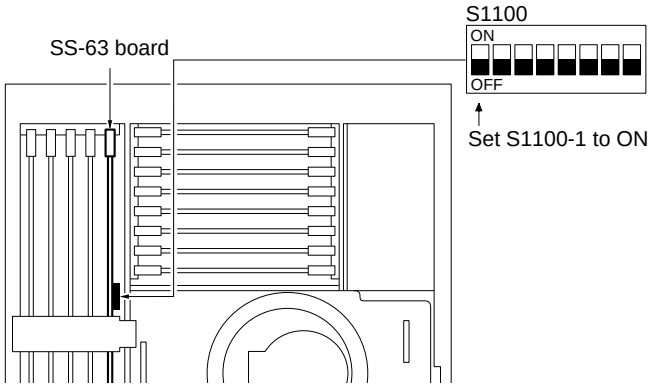
Connection 3



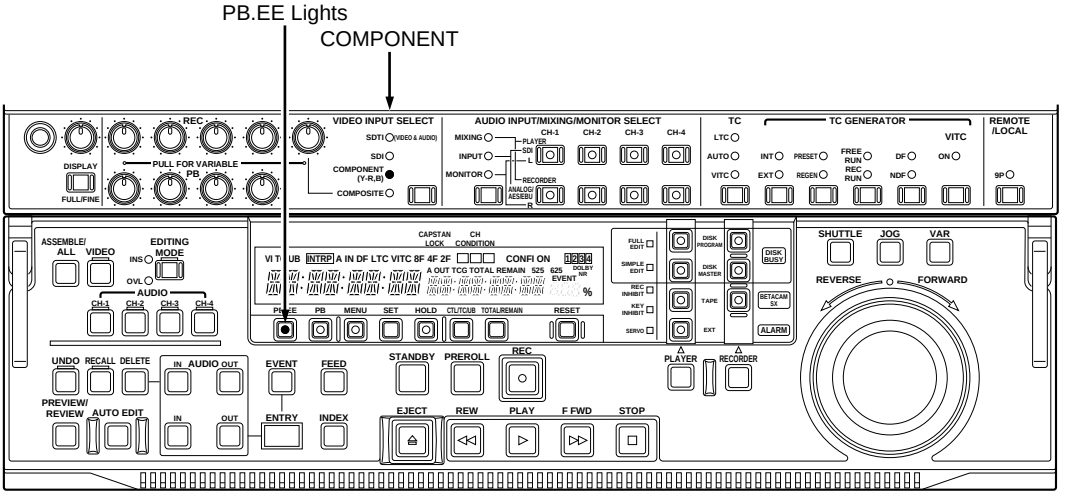
Setting of Unit Side

1. Turn on the power.

2. Set S1100-1 on the SS-63 board to ON (CLOSE) to treat the extended menu.

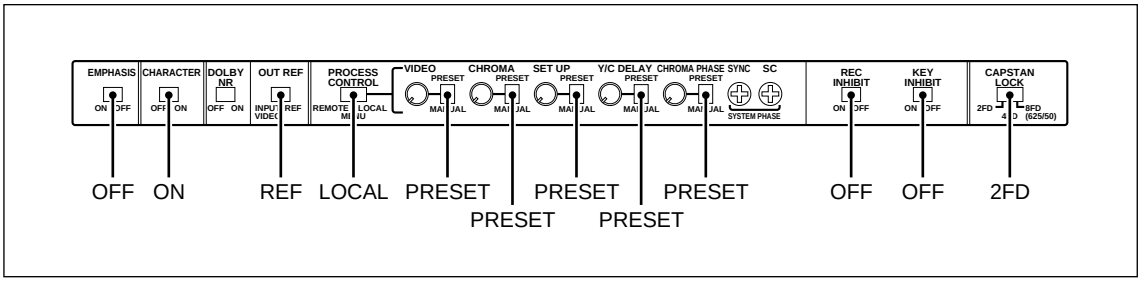


3. Set each switch on the control panels as shown below.



This figure is for DNW-A100.

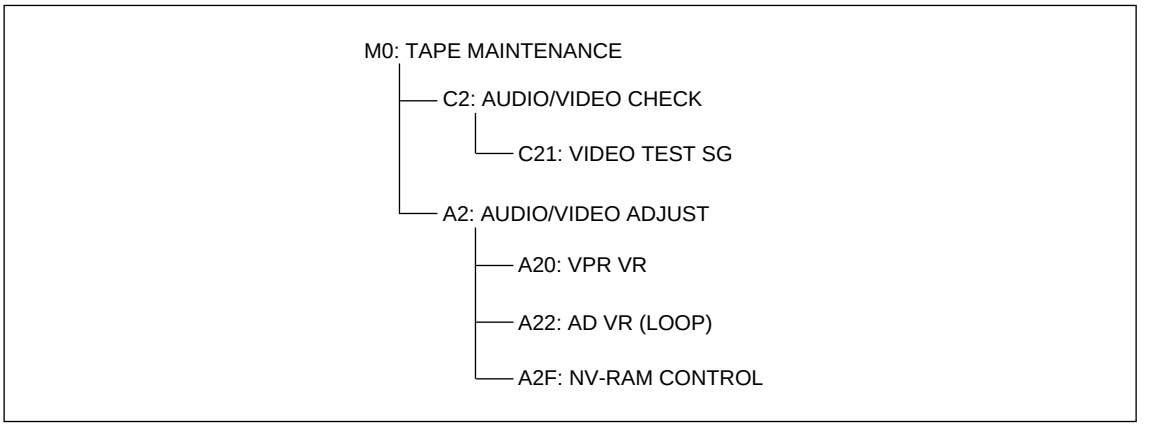
Upper/Lower Control Panels



Sub Control Panel

Note

The sub mode and menu of the maintenance mode that is used when installing the AD-105 board (BKNW-104) is as shown below.



Check and Adjustment

Preparation

Check which this unit operates in 525/60 system or 625/50 system.

- When this unit operates in 525/60 system
  ① Set the ITEM-709 and 713 of the setup menu.

ITEM	SUB-ITEM	Setting	Previous setting (fill-up)
709: CAV LEVEL FORMAT	0. INPUT CAV LEVEL	B-CAM	
	1. OUTPUT CAV LEVEL	D-1	
713: VIDEO SETUP REFERENCE LEVEL	0. MASTER LEVEL	0.0 %	
	1. INPUT LEVEL	MSTER	
	2. VBLK REMOVE CNT	REMOV	
	3. BETACAM PB LEVEL	MSTER	
	4. OUTPUT LEVEL	MSTER	

  ② Perform 1 through 7 of Check and Adjustment in 525/60 system.

- When this unit operates in 625/50 system
  Perform 1, 3, 4, 5 and 7 of Check and Adjustment in 625/50 system. Then switch to 525/60 system, and perform 8.

Note

The check and adjustment of the component video Betacam level can be performed when this unit operates in 525/60 system.

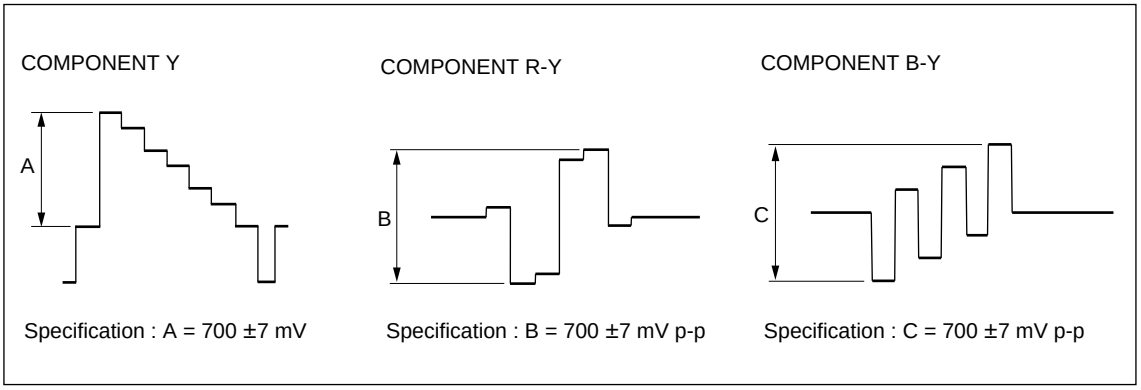
Note

Wait more than 30 minutes after turning on the power, then perform the check and adjustment.

1. Component Video Output Level Check

Refer to 4-1 page for the operation method of the maintenance mode when checking.

(1) Connect as connection 1.
(2) Push S1101 on the SS-63 board so as to enter the maintenance mode.
(3) Select C21: VIDEO TEST SG of C2: AUDIO/VIDEO CHECK of the maintenance mode.
(4) Set TEST SG output to “100% Color Bars”.
(5) Check using a waveform monitor that the levels of Y, R-Y and B-Y satisfy the specifications.
When the specifications are satisfied, perform “2. Component Video Betacam Output Level Check”.
If the specifications are not satisfied, perform “2. Component Video Output Level Adjustment” of Section 6-9-2 of the maintenance manual part 1. (Electrical adjustment after replacement of the VPR-17 board.)



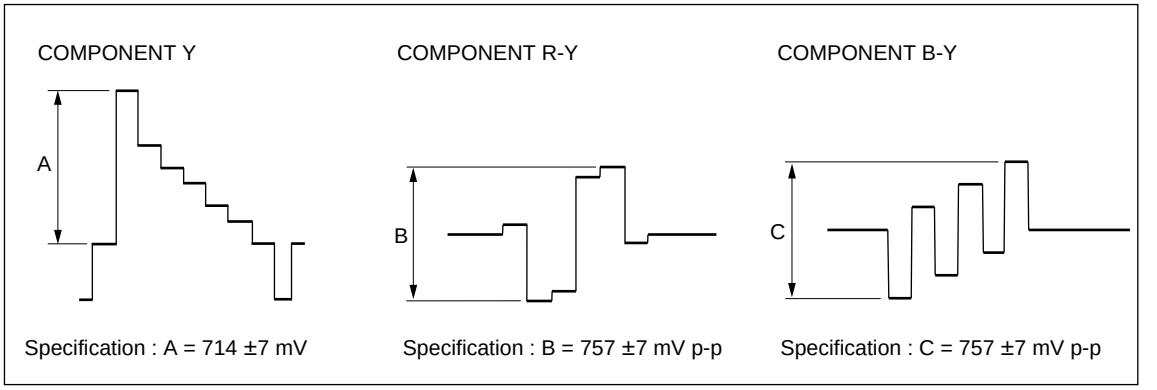
2. Component Video Betacam Output Level Check (In 525/60 system)

Note

This check can be performed only in 525/60 system.
When the check is performed in 625/50 system, go to “3. Component Video Output Phase Check”.

Refer to 4-1 page for the operation method of the maintenance mode when checking.

(1) Connect as connection 1.
(2) Select SUB-ITEM 1: OUT PUT CAV LEVEL of ITEM-709 CAV LEVEL FORMAT, and set to “B-CAM”.
(3) Select C21: VIDEO TEST SG of C2: AUDIO/VIDEO CHECK of the maintenance mode.
(4) Set TEST SG output to “75% Color Bars”.
(5) Check using a waveform monitor that the levels of Y, R-Y and B-Y satisfy the specifications.
When the specifications are satisfied, perform “3. Component Video Output Phase Check”.
If the specifications are not satisfied, perform “3. Component Video Output (BETACAM) Level Adjustment” of Section 6-9-2 of the maintenance manual part 1. (Electrical adjustment after replacement of the VPR-17 board.)



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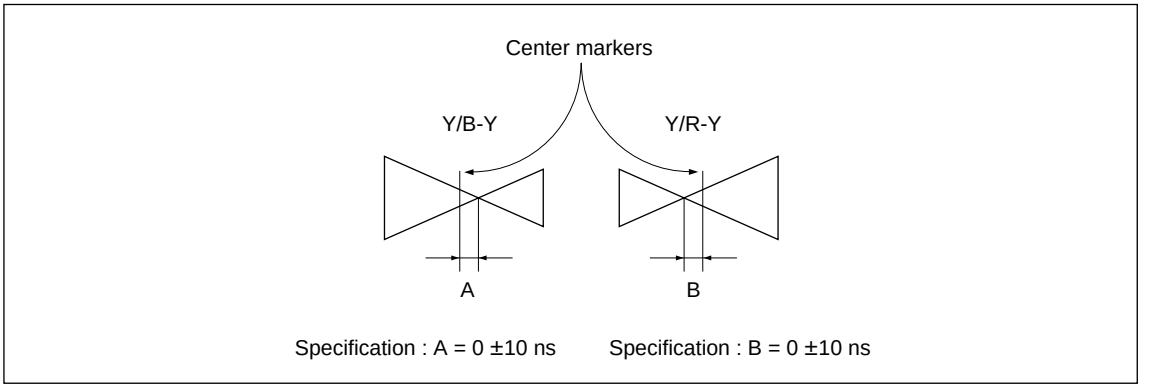
3. Component Video Output Phase Check

Refer to 4-1 page for the operation method of the maintenance mode when checking.

(1) Connect as connection 1.
(2) Select C21: VIDEO TEST SG of C2: AUDIO/VIDEO CHECK of the maintenance mode.
(3) Set TEST SG output to BOWTIE.
(4) Set the waveform monitor to BOWTIE mode.
(5) Measure the cross points of Y and B-Y, Y and R-Y, then check using a waveform monitor that the deviation between the dip points and the center markers satisfy the specifications.
(6) Push the MENU button two times so as to exit C2: AUDIO/VIDEO CHECK.

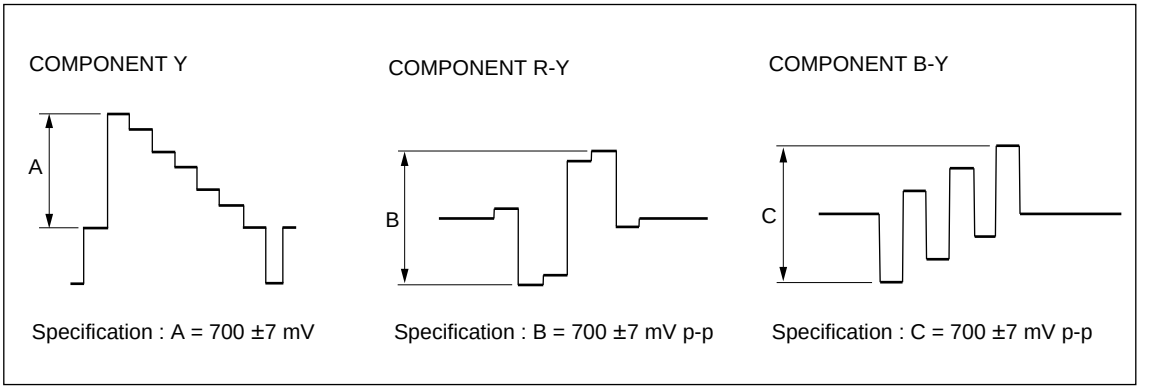


(7) Reset the setting of S1100-1 on the SS-63 board to its previous state.
(8) When this unit operates in 525/60 system, reset the ITEM-709 and 713 to their previous state.

4. Component Video Input Leve Adjustment

Refer to 4-1 page for the operation method of the maintenance mode when adjusting.

(1) Connect as connection 2.
(2) Select A22: AD VR (LOOP) of A2: AUDIO/VIDEO ADJUST of the maintenance mode.
(3) Select “Y INPUT LEVEL”.
(4) Adjust “Y INPUT LEVEL” that the level of Y satisfies the specification.
(5) Select “R-Y INPUT LEVEL”.
(6) Adjust “R-Y INPUT LEVEL” that the level of R-Y satisfies the specification.
(7) Select “B-Y INPUT LEVEL”.
(8) Adjust “B-Y INPUT LEVEL” that the level of B-Y satisfies the specification.

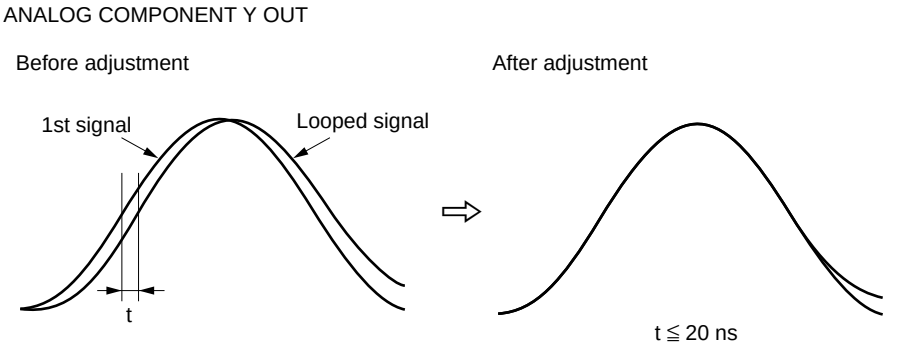


(9) After completing the adjustments, push the MENU button once so as to exit A22: AD VR (LOOP).
(10) Select A2F: NV-RAM CONTROL and save the adjusted data in NV-RAM (execute “SAVE ALL ADJUST DATA”).
(11) Check that the message “Save Complete” is displayed on the video monitor screen.
(12) Push the MENU button once so as to exit A2F: NV-RAM CONTROL.

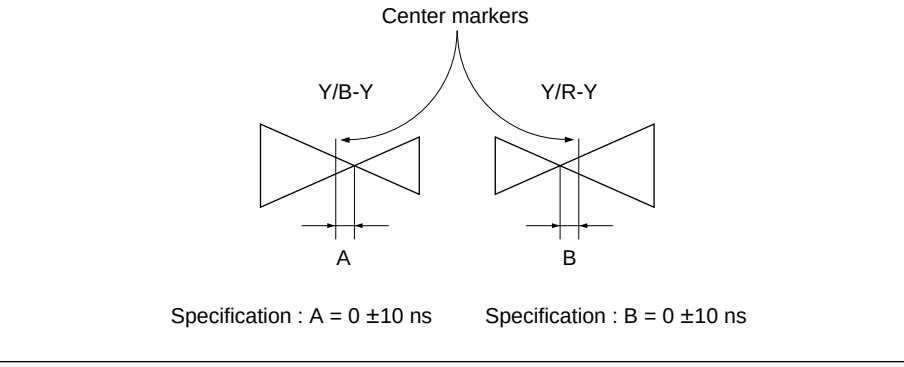
5. Component Video Input Phase Adjustment

Refer to 4-1 page for the operation method of the maintenance mode when adjusting.

(1) Connect as connection 3 or 2.
(2) Select “Y INPUT PHASE” of A22: AD VR (LOOP) of the maintenance mode.
(3) Magnify the horizontal axis on the screen of the waveform monitor, then display 2T pulse.
(4) Adjust that 1st signal and signal after looping overlap.



(5) Set the waveform monitor to BOWTIE mode.
(6) Select “Y/B-Y INPUT DELAY”.
(7) Measure the cross point of Y and B-Y, then adjust “Y/B-Y INPUT DELAY” that the deviation between the dip point and the center marker satisfies the specification.
(8) Select “Y/R-Y INPUT DELAY”.
(9) Measure the cross point of Y and R-Y, then adjust “Y/R-Y INPUT DELAY” that the deviation between the dip point and the center marker satisfies the specification.



(10) After completing the adjustment, push the MENU button once so as to exit A22: AD VR (LOOP).
(11) Select A2F: NV-RAM CONTROL and save the adjusted data in NV-RAM (execute “SAVE ALL ADJUST DATA”).
(12) Check that the message “Save Complete” is displayed on the video monitor screen.
(13) Push the MENU button once so as to exit A2F: NV-RAM CONTROL.

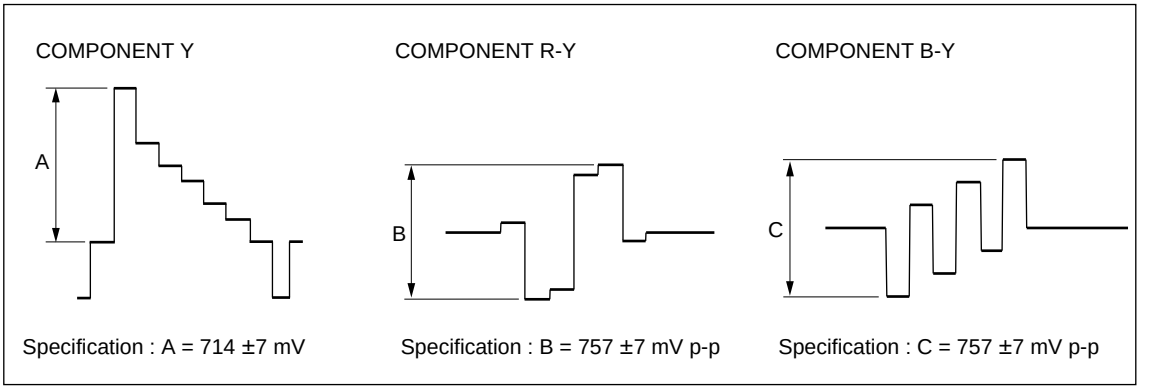
6. Component Video Betacam Input Level Adjustment (In 525/60 system)

Note

This adjustment can be performed only in 525/60 system, When the adjustments are performed in 625/50 system, go to “7. Component Video Input Frequency Response Adjustment”.

Refer to 4-1 page for the operation method of the maintenance mode when adjusting.

(1) Connect as connection 3 or 2.
(2) Select “B-CAM Y IN LEVEL” of A22: AD VR (LOOP) of the maintenance mode.
(3) Adjust “B-CAM Y IN LEVEL” that the level of Y satisfies the specification.
(4) Select “B-CAM R-Y IN LEVEL”.
(5) Adjust “B-CAM R-Y IN LEVEL” that the level of R-Y satisfies the specification.
(6) Select “B-CAM B-Y IN LEVEL”.
(7) Adjust “B-CAM B-Y IN LEVEL” that the level of B-Y satisfies the specification.

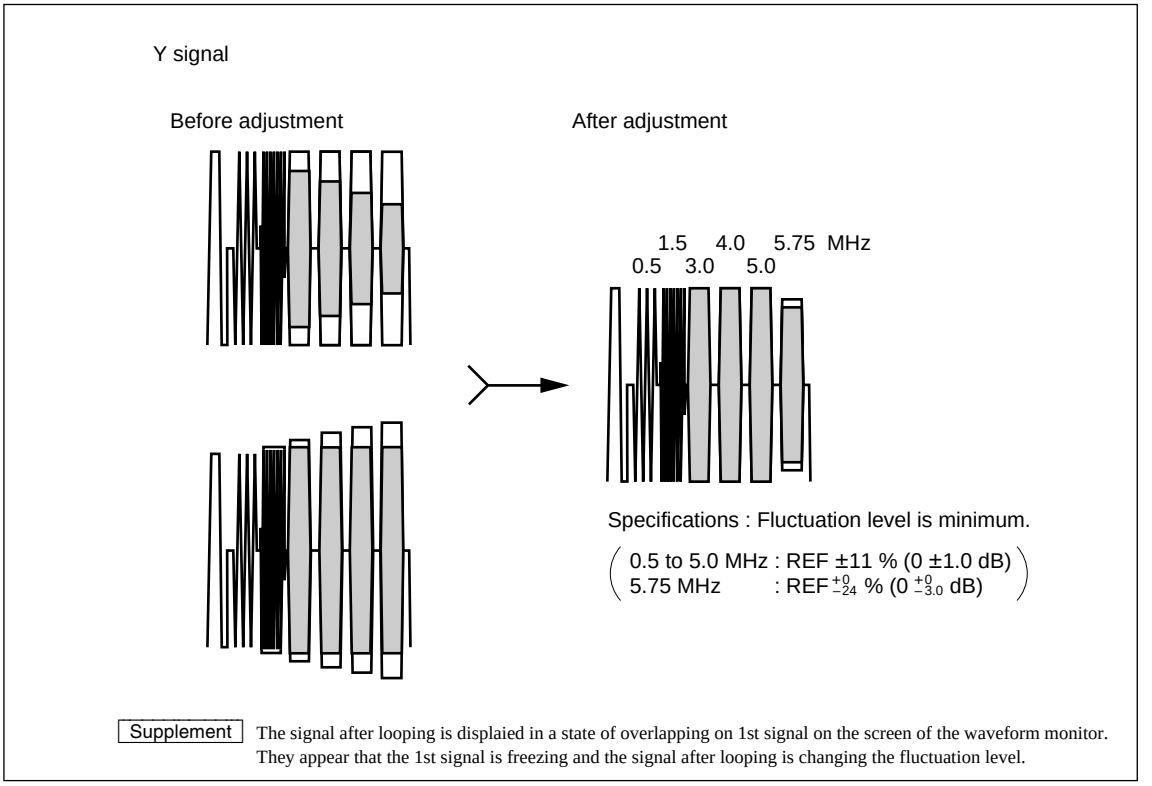


(8) After completing the adjustments, push the MENU button once so as to exit A22: AD VR (LOOP).
(9) Select A2F: NV-RAM CONTROL and save the adjusted data in NV-RAM (execute”SAVE ALL ADJUSTMENT DATA”) .
(10)Check that the message “Save Complete” is displayed on the monitor screen.
(11)Push tne MENU button once so as to exit A2F: NV-RAM CONTROL.

7. Component Video Input Frequency Response Adjustment

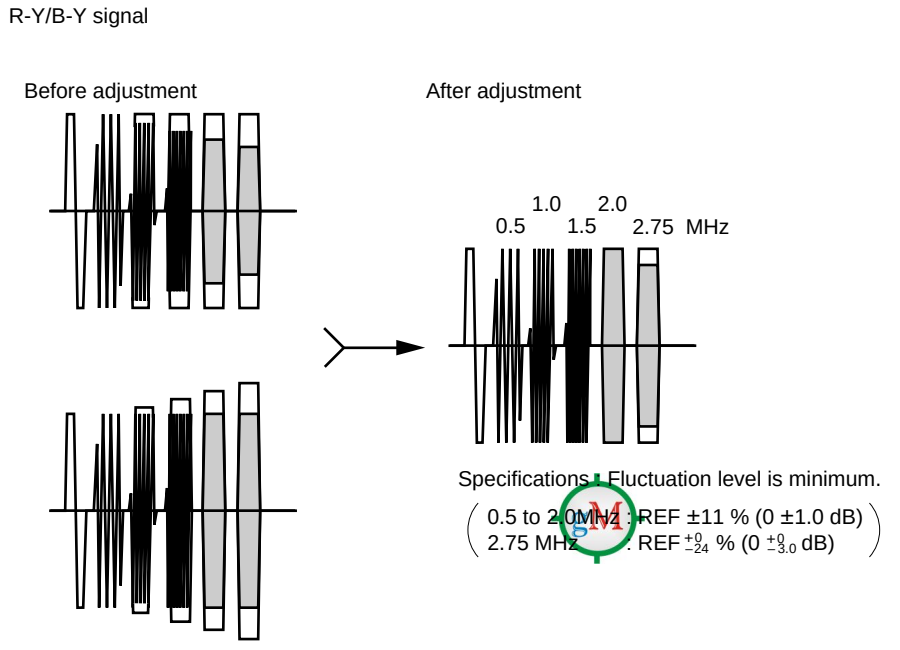
Refer to 4-1 page for the operation method of the maintenance mode when adjusting.

(1) Connect as connection 3.
(2) Select “Y FREQ COMP” of A22: AD VR (LOOP) of the maintenance mode.
(3) Adjust “Y FREQ COMP” that the fluctuation level is minimum.
(4) Regard 1st signal of each frequency as 100 % (REF), then check that the level of signal after looping satisfies the specifications.



Supplement The signal after looping is displaied in a state of overlapping on 1st signal on the screen of the waveform monitor. They appear that the 1st signal is freezing and the signal after looping is changing the fluctuation level.

(5) Select “R-Y FREQ COMP”.
(6) Adjust “R-Y FREQ COMP” that the fluctuation level is minimum.
(7) Regard 1st signal of each frequency as 100 % (REF), then check that the level of signal after looping satisfies the specifications.
(8) Select “B-Y FREQ COMP”.
(9) Adjust “B-Y FREQ COMP” that the fluctuation level is minimum.
(10) Regard 1st signal of each frequency as 100 % (REF), then check that the level of signal after looping satisfies the specifications.



Supplement The signal after looping is displaied in a state of overlapping on 1st signal on the screen of the waveform monitor. They appear that the 1st signal is freezing and the signal after looping is changing the fluctuation level.

(11) After completing the adjustment, push the MENU button once so as to exit A22: AD VR (LOOP).
(12) Select A2F: NV-RAM CONTROL and save the adjusted data in NV-RAM (execute “SAVE ALL ADJUST DATA”).
(13) Check that the message “Save Complete” is displayed on the video monitor screen.
(14) • For 525/60 system
Push the MENU button four times so as to exit the maintenance mode.
• For 625/50 system
Perform “8. Component Video Betacam Level Check and Adjustment”.

8. Component Video Betacam Level Input Check and Adjustment (In 625/50 system)

When this unit is adjusted in 625/50 system, perform this adjustment after switching this unit to 525/60 system.
When this unit is adjusted in 525/60 system, this adjustment is not required.

Refer to 4-1 page for the operation method of the maintenance mode when adjusting.

Importance

If the 525/625 line systems are switched, the signal that had recorded on the HDD is erased. It is impossible to bring the data back.

(1) Switch the 525/625 line systems by the setup menu ITEM-013 525/625 SYSTEM SELECT. (Refer to Section 7-2-2 of the operation manual.)
(2) Check that the COMPONENT indicator of the VIDEO INPUT SELECT on the upper control panel illuminates. And check that the PB.EE button on the lower control panel illuminates.
(3) Set the ITEM-709 and 713 of the setup menu.

ITEM	SUB-ITEM	Setting	Previous setting (fill-up)
709: CAV LEVEL FORMAT	0. INPUT CAV LEVEL	B-CAM	
	1. OUTPUT CAV LEVEL	B-CAM	
713: VIDEO SETUP REFERENCE LEVEL	0. MASTER LEVEL	0.0 %	
	1. INPUT LEVEL	MSTER	
	2. VBLK REMOVE CNT	REMOV	
	3. BETACAM PB LEVEL	MSTER	
	4. OUTPUT LEVEL	MSTER	

(4) Perform “2. Component Video Betacam Output Level Check”.
(5) Perform “6. Component Video Betacam Input Level Adjustment”.
(6) Push the MENU button several times so as to exit the maintenance mode.
(7) Return the SUB-ITEMs of the setup extended menus ITEM-709 and ITEM-713 to their previous settings.
(8) Switch to the 625/50 system by the setup menu ITEM-013.
(Refer to Section 7-2-2 of the operation manual.)
(9) Reset the setting of S1100-1 on the SS-63 board to its previous state.

4-4. CP-308 Board and DIF-44 Board (BKNW-105)

Perform the operation check only after maintaining the CP-308 board and DIF-44 board. The adjustment is not required.

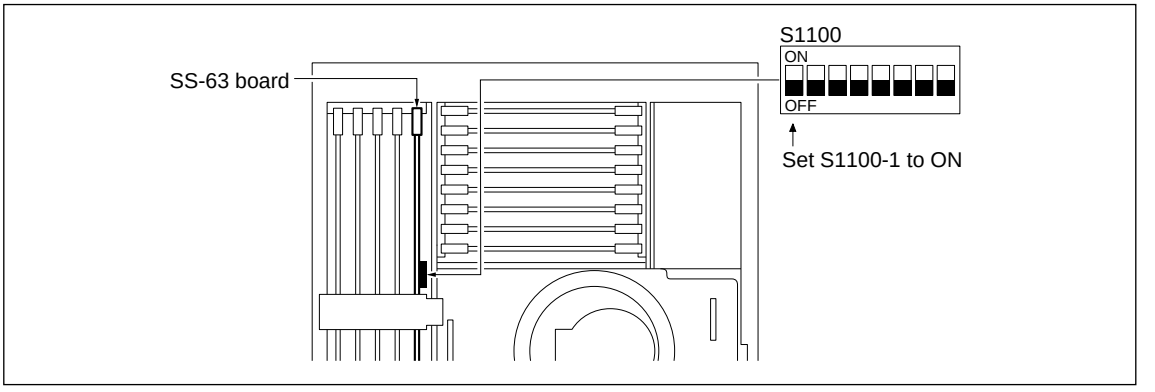
4-4-1. Operation Check

Equipment

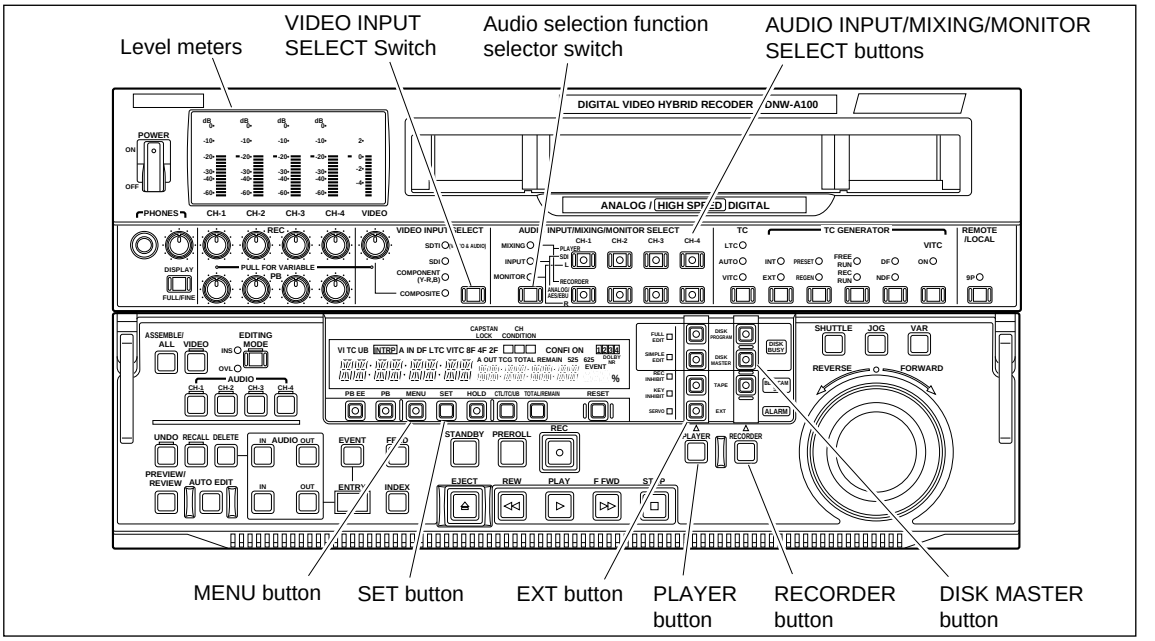
Video monitor
Headphones
BNC cables (For the loop connection) 2 pcs.

Procedure

1. Connect between the VIDEO OUTPUT COMPOSITE 3 (SUPER) connector of the unit and a video monitor.
2. Plug the headphones.
3. Set S1100-1 on the SS-63 board to ON (CLOSE) to treat the extended menu.



Check



(1) Turn on the power.
(2) Select EXT as a player device, and DISK MASTER as a recorder device.
(Push the EXT button while pressing the PLAYER button. Push the DISK MASTER button while pressing the RECORDER button.)
(3) Set the all channels (CH-1/2/3/4) of AUDIO INPUT/MIXING/MONITOR SELECT to AES/EBU.

Generation of internal test signal of VIDEO/AUDIO [through step (12)]

(4) Push the MENU button to enter the set up menu mode.
(5) Turn the search dial to select ITEM-710 INTERNAL VIDEO SIGNAL GENERATOR.
(6) Turn the search dial while pressing the JOG button on the lower control panel, and set to “100% Color Bars” .
(7) Turn the search dial to select ITEM-808 INTERNAL AUDIO SIGNAL GENERATOR.
(8) Turn the search dial while pressing the JOG button on the lower control panel, and set to “1KHz SINE 0VU” .
(9) Push the SET button to exit the set up menu mode.
(10) Press the VIDEO INPUT SELECT switch more than three seconds to cause the four indicators to illuminate. = Internal signal generator generates the video test signal.
(11) Illuminate the INPUT indicator.
(12) Press the CH-1 button of the AUDIO INPUT/MIXING/MONITOR SELECT (SDI line or ANALOG/AES/EBU line) more than three seconds to cause the all buttons to illuminate. =Internal signal generator generates the audio test signal (1 kHz).

Record the internal test signal to the hard disk drives [through step (16)]

(13) Push the REC button while pressing the PLAY button, and record the signal to the hard disk drives for thirty seconds.
(14) Push the STOP button to stop the recording.
(15) Push the VIDEO INPUT SELECT switch to stop the video test signal.
(16) Push one of the AUDIO INPUT/MIXING/MONITOR SELECT buttons to stop the audio test signal.

Note

The audio test signal can be stopped when only the INPUT indicator illuminates.

Preparation for dubbing [through step (26)]

(17) Select DISK MASTER as a player device.
(Push the DISK MASTER button while pressing the PLAYER button.)
(18) Push the MENU button to enter the set up menu mode.
(19) Turn the search dial while pressing the PLAY button to select ITEM-322 AUDIO SIGNAL FLOW D-D.
(20) Turn the search dial while pressing the JOG button on the lower control panel, and set to “ext”.
(21) Push the SET button to exit the set up menu mode.
(22) Connect the BNC cable between CH-1/2 of AUDIO OUTPUT (AES/EBU) and CH-1/2 AUDIO INPUT (AES/EBU) of the connector panel.
(23) Connect the BNC cable between CH-3/4 of AUDIO OUTPUT (AES/EBU) and CH-3/4 AUDIO INPUT (AES/EBU) of the connector panel.
(24) Push the PLAYER button, and check that the INDEX button stays unlit.
(25) Push the F FWD button. = Skips to the end of the MASTER FILE that is recorded in step (13) as a player.
(26) Push the INDEX button to illuminate, and push the REW button. = Skips to the beginning of the MASTER FILE that is recorded in step (13) as a player.

Dubbing in the hard disk drives [through step (31)]

(27)Push the PLAY button.
(28)Push the RECORDER button.
(29)Push the PLAY button while pressing the REC button, and dub the MASTER FILE that is recorded in step (13) for fifteen seconds.
(30)Push the STOP button to stop the recording.
(31)Push the STOP button after pushing the PLAYER button to stop the PLAYER.

Check [through step (37)]

(32)Wear the headphones.
(33)Select the EXT as a player device. (Push the EXT button while pressing the PLAYER button.)
(34)Push the PLAY button to playback the file that is recorded in step (29), and check that the all audio level meter (CH-1/2/3/4) read −20 dB FS.
(35)Switch to MONITOR by audio selection function selector switch.
(36)Check that the noise is not heard while switching the CH-1/2/3/4.
(37)Push the STOP button to stop the playback, and remove the BNC cables that were connected in steps (22) and (23).

Note

Be sure to remove the BNC cable before going to the next step.

Handling after check [through step (42)]

(38)Push the MENU button to enter the setup menu mode.
(39)Set ITEM-710 INTERNAL VIDEO SIGNAL GENERATOR and ITEM-808 INTERNAL AUDIO SIGNAL GENERATOR to “OFF”. Set ITEM-322 AUDIO SIGNAL FLOW D-D to “int”.
(40)Push the SET button to exit the setup menu mode.
(41)Set S1100-1 on the SS-63 board to its previous state.
(42)Delete the file that is recorded. (Refer to “Chapter 5. Editing Using the Built-in Hard Disk” of the operation manual.)

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Section 5
Replacement of Main Parts

This section explains the replacement procedures of periodic replacement parts, main mechanical parts, hard disk drive, power supply block, and circuit boards.

5-1. General Information for Parts Replacement

5-1-1. Index

The parts that are explained the replacement procedures in Section 5 are as shown in the tables below.

(1) Mechanical Parts, Hard Disk Drive and Power Supply Block

Items		Page
5-2.	Upper Drum Assembly Replacement	5-9
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5-7.	Pinch Roller Replacement	5-37
5-8.	CTL Head Replacement	5-40
5-9.	Reel Motor Assembly Replacement	5-44
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5-13.	Fan Motor Replacement	5-86
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5-16.	S Tension Regulator Assembly Replacement	5-110
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5-20.	Threading Ring and Ring Roller Replacement	5-134
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5-27.	Reel Shift Gear Replacement	5-171
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5-29.	Cassette Compartment Motor Replacement	5-181
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5-31.	Hard Disk Drive Replacement	5-189

(2) Mounted Circuit Boards

Note

Refer to Section 6 in Maintenance Manual Part 1 for plug-in board replacement.

Board name	Procedure
AC-169	Refer to the exploded views in Maintenance Manual Part 2 Vol.2 Section 2.
APR-12	Plug-in board
APR-13	Plug-in board
CCM-15	Refer to “5-19. Gear Box Assembly and Threading Motor Replacement” or “5-28. Reel Shift Motor Replacement”. It is not required to remove the motor and M gear.
CL-29	Refer to the exploded views in Maintenance Manual Part 2 Vol.2 Section 2.
CP-277	Refer to Section 5-32-1.
CP-278	Refer to Section 5-32-2.
CP-297	Refer to Section 5-32-3.
CP-300	Refer to Section 5-32-4.
CP-301	Refer to Section 5-32-5.
CP-308	Refer to Section 1-19 in Maintenance Manual Part 1.
DIF-42	Plug-in board
DM-89	Plug-in board
DPR-71	Plug-in board
DPR-73	Plug-in board
DR-315	Refer to Section 5-32-6.
EQ-56	Plug-in board
FP-91	Refer to Section 5-32-7.
KY-364	Refer to Section 5-32-8.
LP-81	Refer to the exploded views in Maintenance Manual Part 2 Vol.2 Section 2.
MB-648	Refer to Section 5-32-9.
MS-50	Refer to Section 5-32-10.
PC-70	Refer to the exploded views in Maintenance Manual Part 2 Vol.2 Section 2.
PD-35	Refer to “5-12. Pinch Solenoid Replacement”. It is not required to remove the pinch press assembly.
PTC-54	Refer to “5-19. Gear Box Assembly and Threading Motor Replacement” and exploded views in Maintenance Manual Part 2 Vol.2 Section 2.
PTC-59	Replace the whole MC sensor assembly including the PTC-59 board. Refer to the exploded views in Maintenance Manual Part 2 Vol.2 Section 2.
PTC-69	Refer to the exploded views in Maintenance Manual Part 2 Vol.2 Section 2. After replacement, perform the electrical adjustment (Section 3-2) before installing the search dial assembly to the lower control panel assembly.
PTC-71	Refer to the exploded views in Maintenance Manual Part 2 Vol.2 Section 2.
RM-82/181	Refer to “5-9. Reel Motor Assembly Replacement”.
SE-341	Refer to Section 5-32-11.
SE-344	Replace the whole reel FG assembly including the SE-344 board. Refer to the exploded views in Maintenance Manual Part 2 Vol.2 Section 2. After replacement, perform the reel rotation sensor position adjustment (Section 5-9-7).

Board name	Procedure
SE-378	Refer to Section 5-32-12.
SSX-1	Plug-in board
SS-63	Plug-in board
SWC-30	Refer to Section 5-32-13.
SWC-31	Refer to Section 5-32-14.
TBC-23	Plug-in board
TBC-24	Plug-in board
TC-96	Refer to Section 5-32-15.
TR-78	Replace with an assembled part. (S tension regulator assemby, refer to Section 5-16.)
TR-79	Refer to Section 5-32-16.
VPR-17	Plug-in board
VR-223	Refer to Section 5-32-17.
VR-224	Refer to Section 5-32-18.

5-1-2. Threading End Mode and Unthreading End Mode

1. Threading End Mode

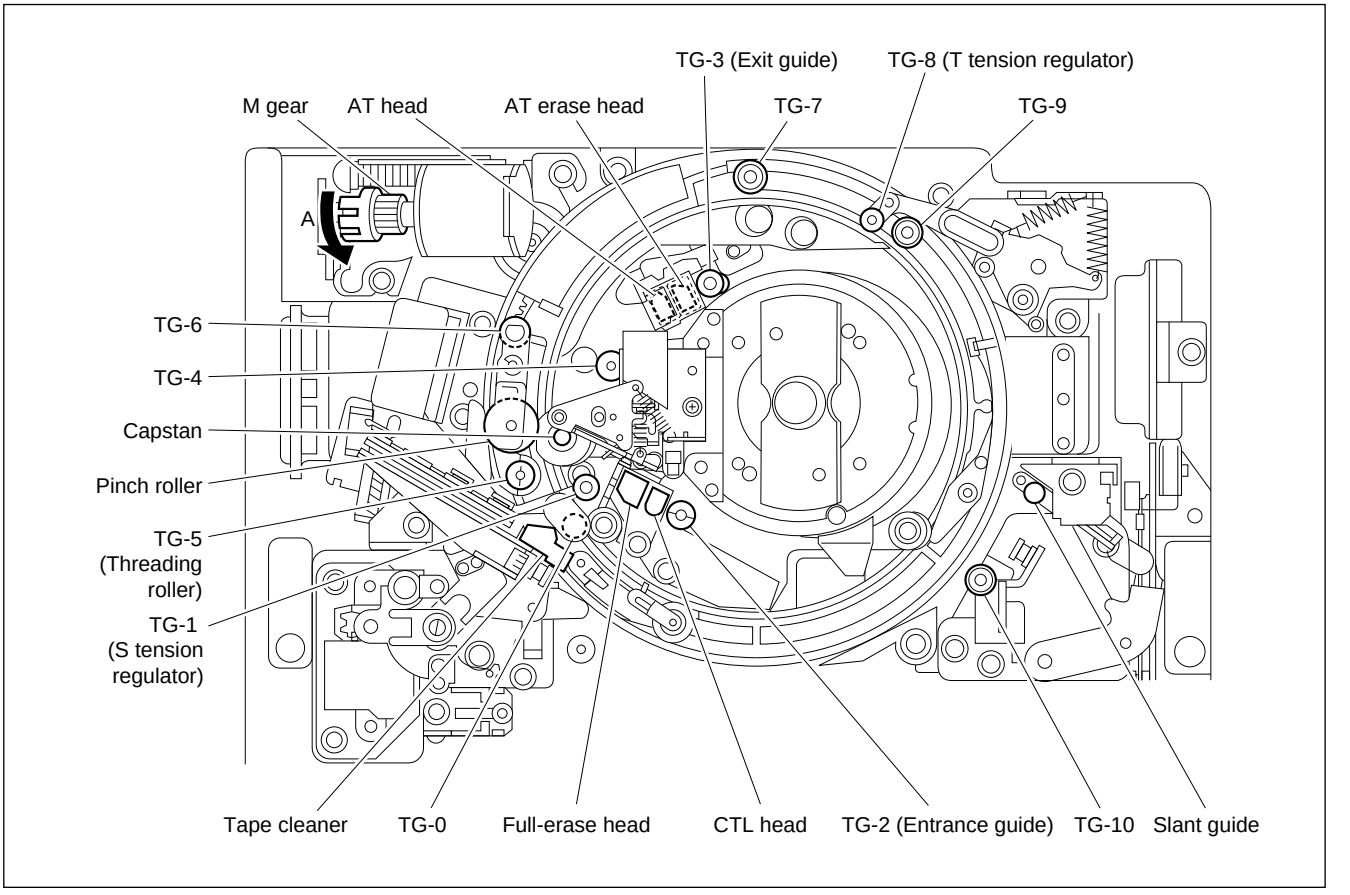
Threading end mode means that the threading ring rotates in the counterclockwise direction, then stops.

There are three ways of putting the unit into the threading end mode without installing the cassette compartment.

Method ①: Turn the power on.

Method ②: Press the STOP button under power-on state.

Method ③: Turn the M gear of the gear box assembly in the direction of the arrow A.



Threading End Mode

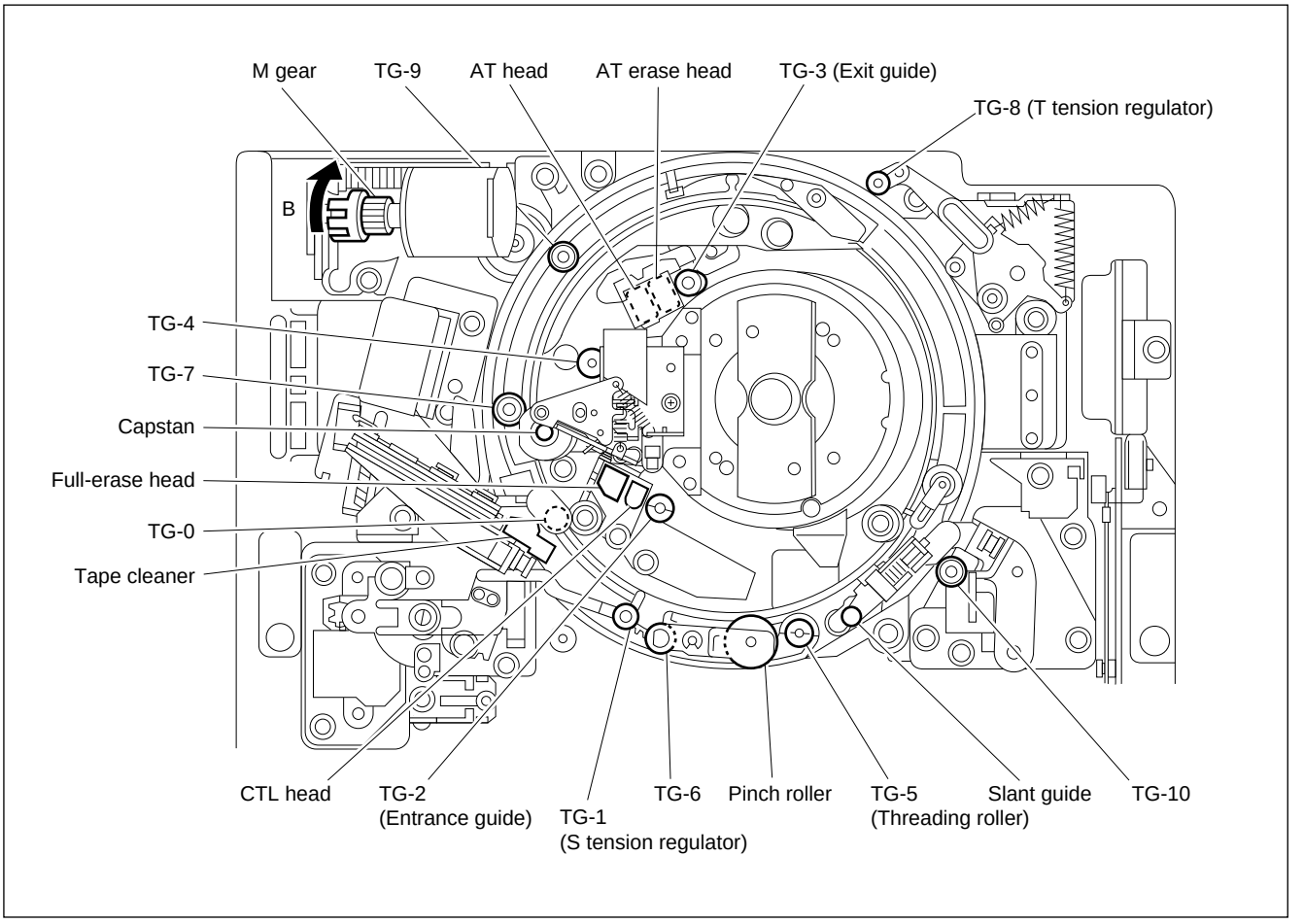
2. Unthreading End Mode

Unthreading end mode means that the threading ring rotates in the clockwise direction, then stops. (It is same state with EJECT completion mode.)

There are two ways of putting the unit into the unthreading end mode without installing the cassette compartment.

Method ①: Press the EJECT button under threading end mode.

Method ②: Turn the M gear of the gear box assembly in the direction of the arrow B.



Unthreading End Mode

5-1-3. L Cassette Position and S Cassette Position

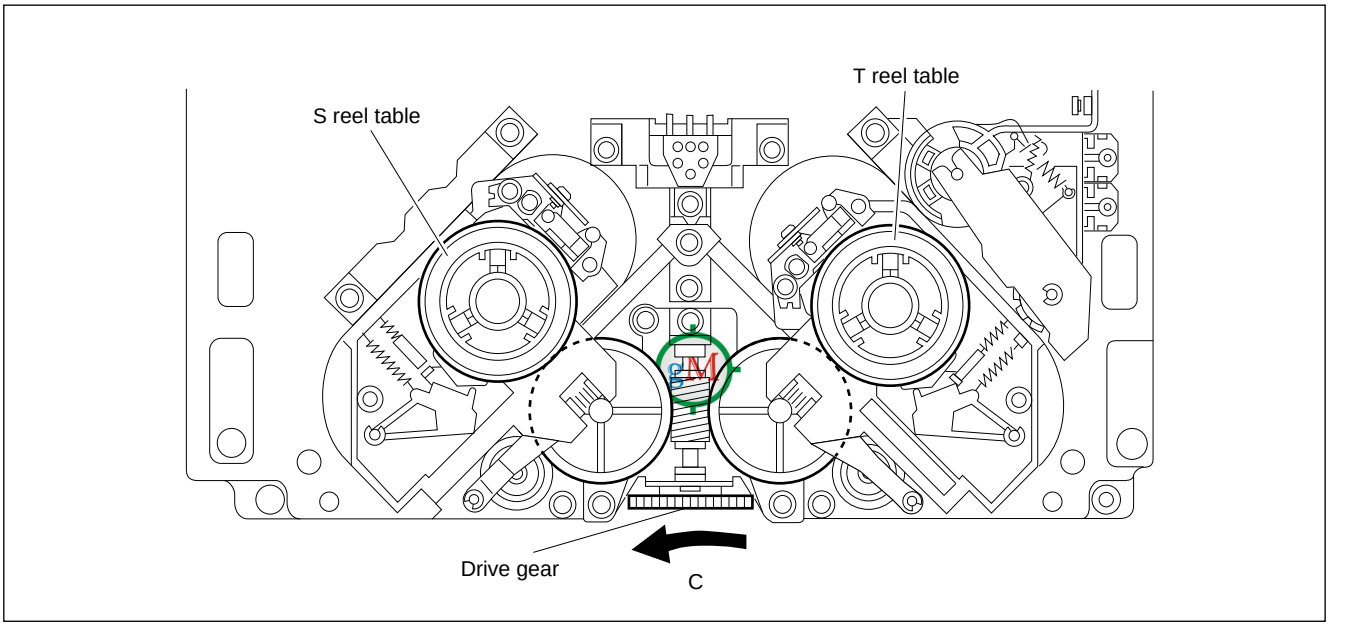
1. L Cassette Position

L cassette position means that the reel tables are in the position of L cassette tape.

There are two ways of putting the reel tables into the L cassette position without installing the cassette compartment.

Method ①: Press the switch S100 (F-1/side A) on the SS-63 board under power-on state.

Method ②: Turn the drive gear in the direction of the arrow C.



L Cassette Position

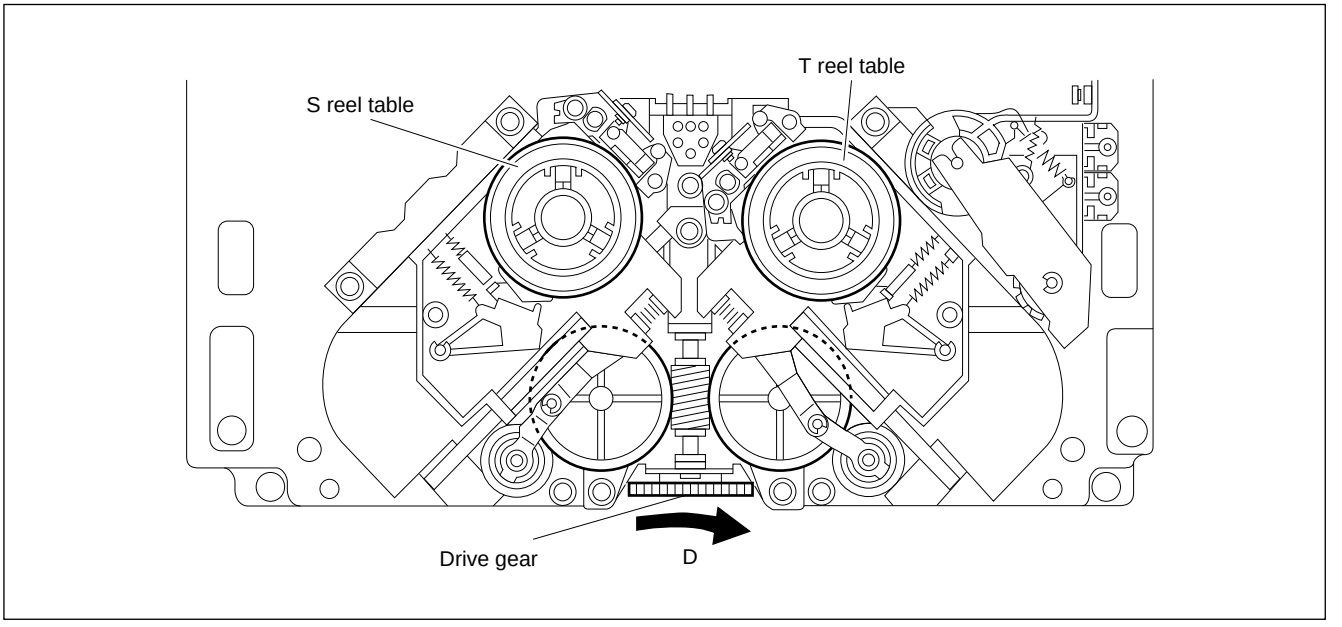
2. S Cassette Position

S cassette position means that the reel tables are in the position of S cassette tape.

There are two ways of putting the reel tables into the S cassette position without installing the cassette compartment.

Method ①: Press the switch S100 (F-1/side A) on the SS-63 board under power-on state.

Method ②: Turn the drive gear in the direction of the arrow D.



S Cassette Position

5-1-4. Basic Knowledge

1. Tape Cleaner

CAUTION

Never touch the edge of the tape cleaner with bare hands.
It is in danger of cutting your finger because the tape cleaner has a sharp edge.
Pay careful attention when replacing or adjusting the peripheral parts.

2. Tools

Clean the surface of the tool using a cleaning cloth moistened with cleaning fluid before use it.

- Cleaning cloth: 3-184-527-01
- Cleaning fluid: 9-919-573-01

Be careful not to damage the tool. If the flawed tool is used, adjustment cannot be performed correctly.

3. Notes

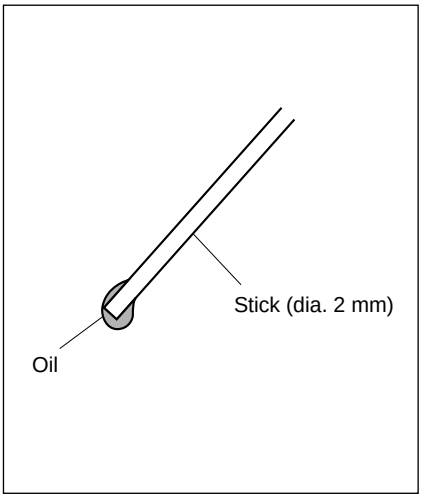
(1) Grease and Oil

Please use only the specified grease and oil.
If the different grease or oil is used, major malfunctions may be caused due to differences in viscosity and ingredients.
And if the grease or oil that has been mixed with dust is used, major malfunctions may be caused.
Use the following grease and oil.

- Grease (SGL-505): 7-661-000-10
- Oil: 7-661-018-18

Apply just enough grease to create a thin film on the surface of the part.
Any grease that adheres to other surrounding parts must be wipe a using gauze or soft cloth.

A drop of oil is defined as follows:
About the amount that will adhere to the end of a stick 2 mm in diameter, as shown in the figure.



Oil

Do not use the grease and oil except for specified portions.

(2) Stop Washer and E Ring

It should not be used the stop washer and E ring once again.
It is recommended checking a required stop washer and E ring before replacement, and preparing more than required number.

5-2. Upper Drum Assembly Replacement

CAUTION

If your hand or screwdriver touches the rotating drum at high speeds, serious injury may occure.

- Perform cleaning or parts replacement after the drum rotation is completely stopped.
- During adjustment, be very carefull not to touch the rotating drum at high speeds.

As for replacement time, refer to “Section 5. Periodic Maintenance and Inspection” in Maintenance Manual Part 1.

Outline

Replacement

1. Remove the Video Head Cleaner Assembly
2. Disconnect the Flexible Board (CN2/SE-341 Board)
3. Remove the Brush/Slip Ring Assembly
4. Release the Demagnetization Head Assembly
5. Remove the Height Determing Plate
6. Remove the Upper Drum Assembly
7. Cleaning (Upper Drum Assembly Mounting Surface, Lower Drum Flange Surface, Tape Running Surface, Lead Surface, and Contacting Points)
8. Attach the Upper Drum Assembly
9. Cleaning (Height Determining Plate’s Lower Surface and Upper Surface of Drum Support)
10. Attach the Height Determing Plate
11. Put the Demagnetization Head Assembly Back
12. Cleaning (DR-294 Board’s Contacting Points and Brush/Slip Ring Assembly Mounting Surface)
13. Attach the Brush/Slip Ring Assembly
14. Connect the Flexible Board (CN2/SE-341 Board)
15. Cleaning (Rotary Heads and Upper Drum’s Tape Running Surface)
16. Attach the Video Head Cleaner Assembly

Adjustment after Replacement

17. Confirm the Tape Running (Refer to Section 7-1-2.)
18. Confirm the Video Tracking (Refer to Section 7-1-3.)
19. Confirm the CTL Head Height (Refer to Section 7-1-4.)
20. Adjust the CTL Head Position (Refer to Section 7-1-5.)
21. Confirm the AT Head Height (Refer to Section 7-1-6.)
22. Confirm the AT Head Azimuth (Refer to Section 7-1-7.)
23. Confirm the AT Head Head-to-tape Contact (Refer to Section 7-1-8.)
24. Adjust the AT Head Position (Refer to Section 7-1-9.)
25. Perform the Electrical Adjustments after Drum Replacement (Refer to Section 6.)

Note

When the rotary head tip was worn or damaged, replace the whole upper drum assembly. It cannot be replaced only head tip.

Basic Knowledge

Replace the upper drum assembly in the following case.

- A correct RF signal waveform cannot be obtained even if the tracking adjustment is performed.

Preparation

1. Turn the power off.
2. Remove the upper lid. (Refer to Section 2-3-1 in Maintenance Manual Part 1.)
3. Remove the plate MD assembly.
   (Refer to Section 2-4 in Maintenance Manual Part 1.)
4. Remove the cassette compartment.
   (Refer to Section 2-5 in Maintenance Manual Part 1.)

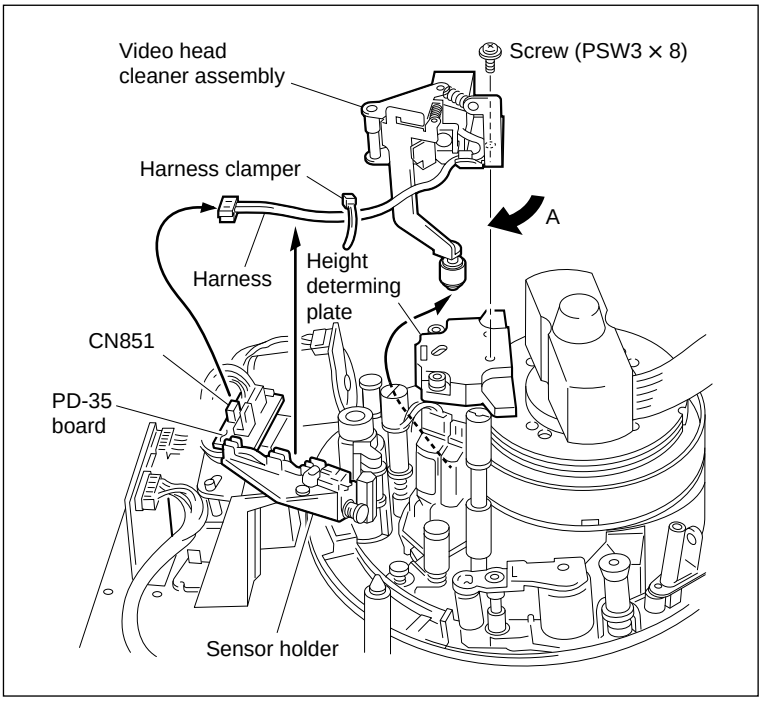
Tools

- Hexagonal wrench driver (2.5 mm): 7-700-766-04
- Torque screwdriver (6 kg•cm)(JB-5251): J-6252-510-A
- Torque screwdriver (12 kg•cm)(JB-5252): J-6252-520-A
- Torque screwdriver's bit (+2 mm, l=75 mm): J-6323-420-A
- Torque screwdriver's hexagonal bit (d=2.5 mm, l=120 mm): J-6251-090-A
- Cleaning cloth: 3-184-527-01
- Cleaning fluid: 9-919-573-01
- Upper drum remover: Supplied with new repair upper drum

Removal

1. Remove the Video Head Cleaner Assembly

(1) Disconnect the harness from connector CN851 on the PD-35 board.
(2) Cut the harness clamper.
(3) Remove the harness from the sensor holder.
(4) Remove the screw, shift the video head cleaner assembly in the direction indicated by the arrow A, and remove it from the height determing plate.



Remove the Rotary Head Cleaner Assembly

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2. Disconnect the Flexible Board

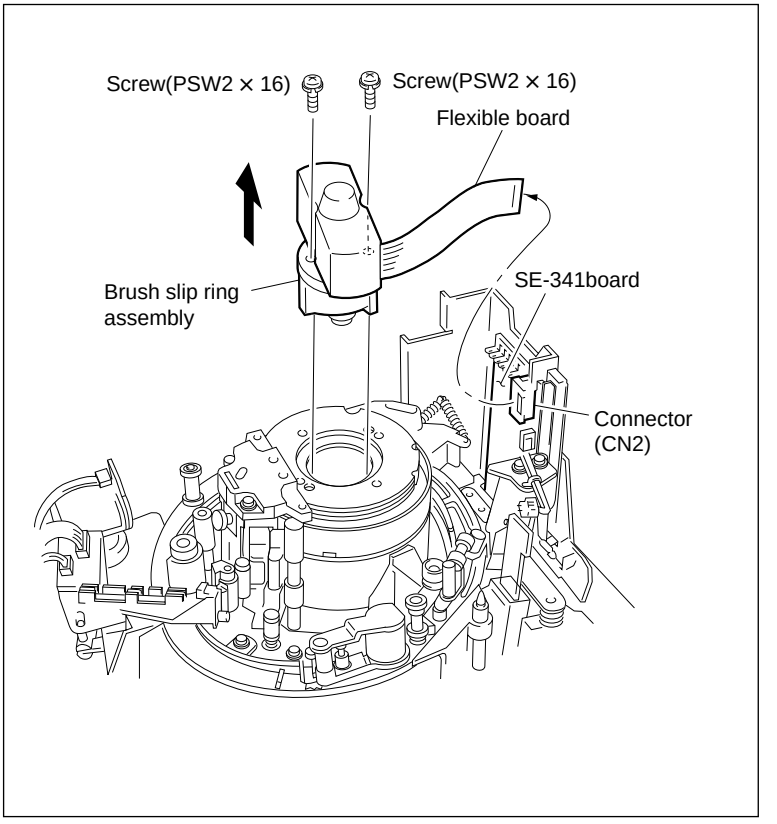
Disconnect the flexible board from connector CN2 on the SE-341 board.

3. Remove the Brush Slip Ring Assembly

Remove the two screws, then remove the brush slip ring assembly.

Notes

- Do not apply excessive force to the brush slip ring assembly at that time.
- If the screws remain into the screw holes of the brush slip ring assembly, remove them once. When the brush slip ring assembly is turned upside down, these screws may be dropped into the slip ring cover.



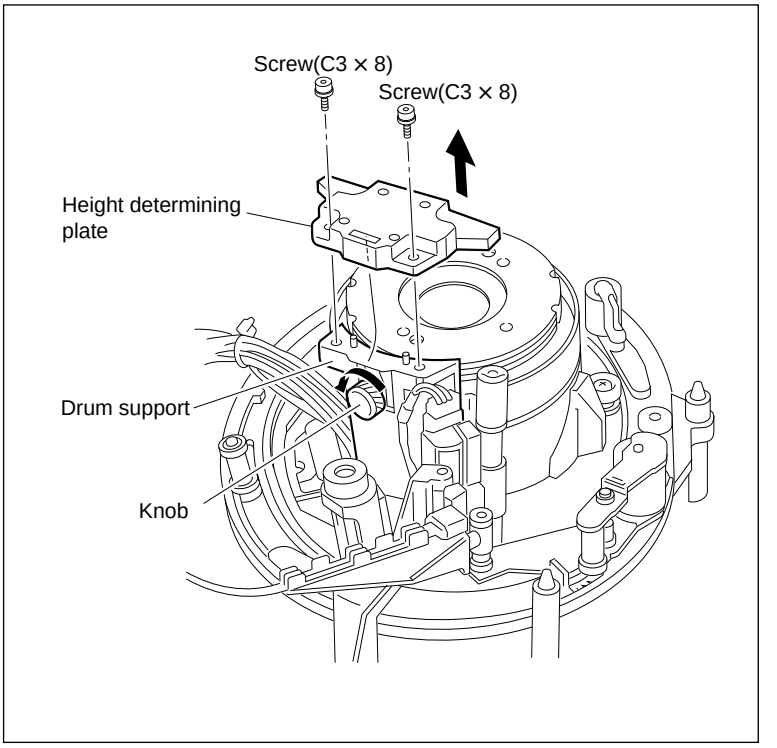
Remove the Brush Slip Ring Assembly

4. Release the Demagnetization Head Assembly

Turn the knob of the demagnetization head assembly counterclockwise about seven turns by finger.

5. Remove the Height Determining Plate

(1) Remove the two screws using a hexagonal wrench driver.
(2) Raise the height determining plate just above, then remove.



Remove the Height Determining Plate

6. Remove the Upper Drum Assembly

(1) Insert the hexagonal wrench driver from the screw hole and loosen the screw completely.

Note

The upper drum assembly is fixed with the four fixing screws (C3 × 12) in the screw holes. These screws cannot be removed because of stoppers.

(2) Check that the projection of the hexagon screw from remover's surfase is 5 mm or less.

Note

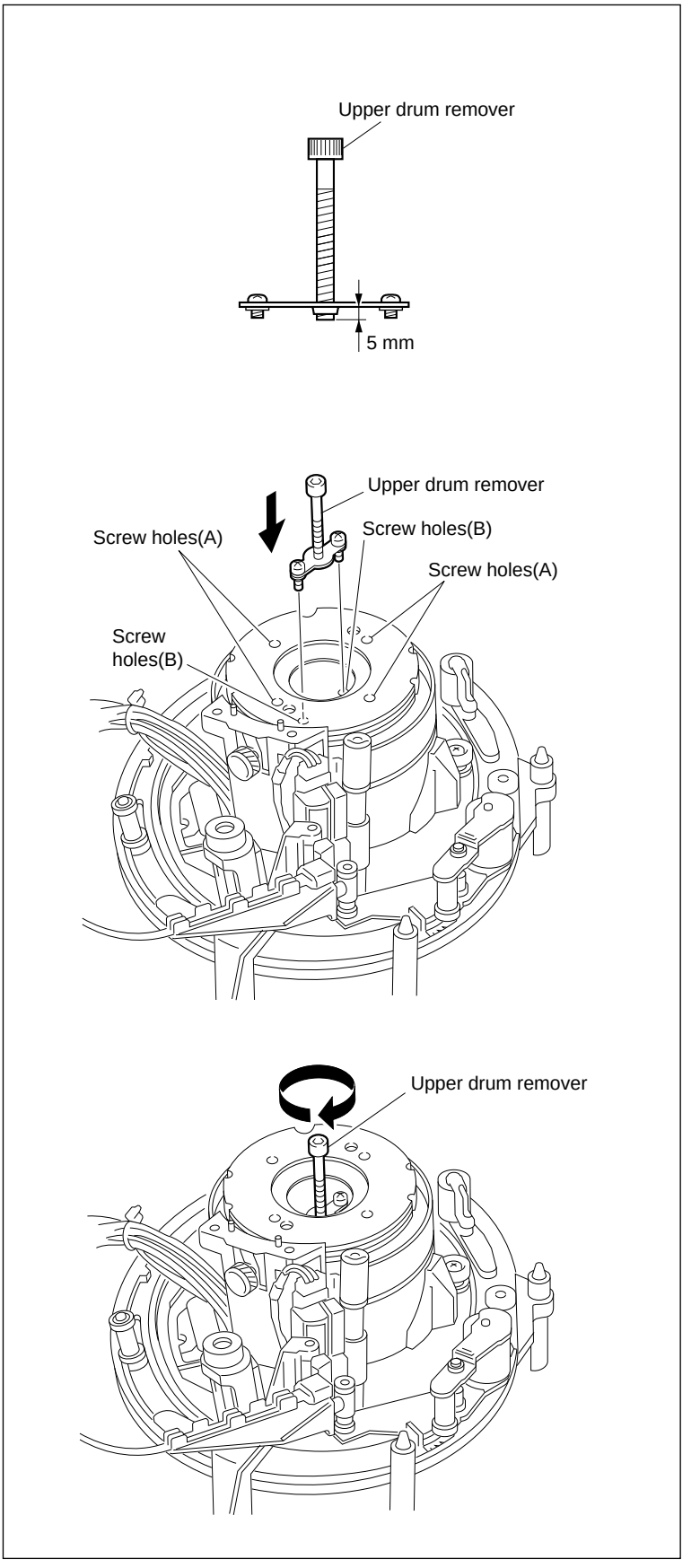
The upper drum remover is supplied with the new upper dum.

(3) Attach the upper drum remover to the two screw holes of the brush slip ring assembly with two screws.

(4) Turn the hexagon screw of the upper drum remover clockwise by finger. The upper drum will be detached from the shaft of the lower drum slowly.

Note

If the four upper drum securing screws are not loosened completely and the hexagon screw of the upper drum remover is rotated, the lower drum may be damaged.



Remove the Upper Drum Assembly

Installation

Note

The upper drum cover is supplied with the upper drum as repair parts. And it is used for positioning of the upper drum. Never remove it in carelessly, and follow the instructions described below.

7. Cleaning

(1) Clean the portions below with a cleaning cloth moistened with cleaning fluid.
- New upper drum assembly mounting surfaces (shaded portions shown in the figure)
- Lower drum flanges (shaded portions shown in the figure) and edge portion
- Lower drum's tape running surface and lead portion (Refer to Section 5-2-4 in Maintenance Manual Part 1.)

Note

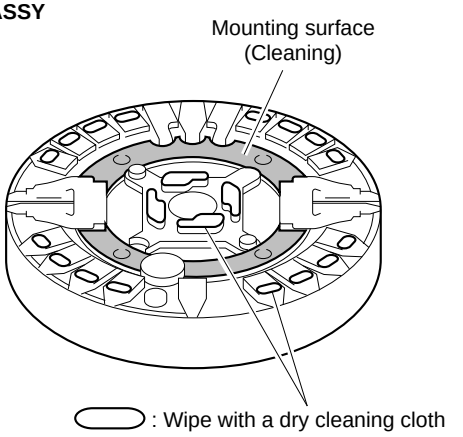
After cleaning, wipe with a dry cleaning cloth.

(2) Wipe the portions shown in figure using a dry cleaning cloth.

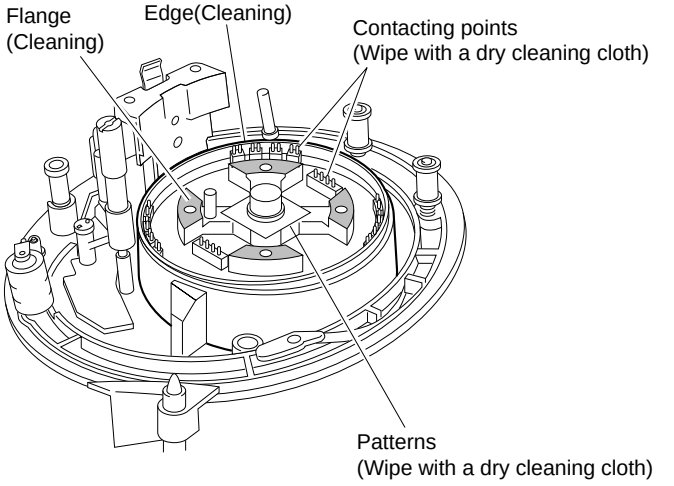
Note

Never apply cleaning fluid to the contacting points and patterns.
- 20 contacting points of upper drum
- 56 patterns of upper drum
- 56 contacting points of lower drum
- 20 patterns of lower drum

- **Upper drum ASSY**



- **Lower drum ASSY**



Cleaning

8. Attach the Upper Drum Assembly

Note

When replacing the upper drum of this model, it is not necessary to do an eccentricity adjustment of the upper drum.

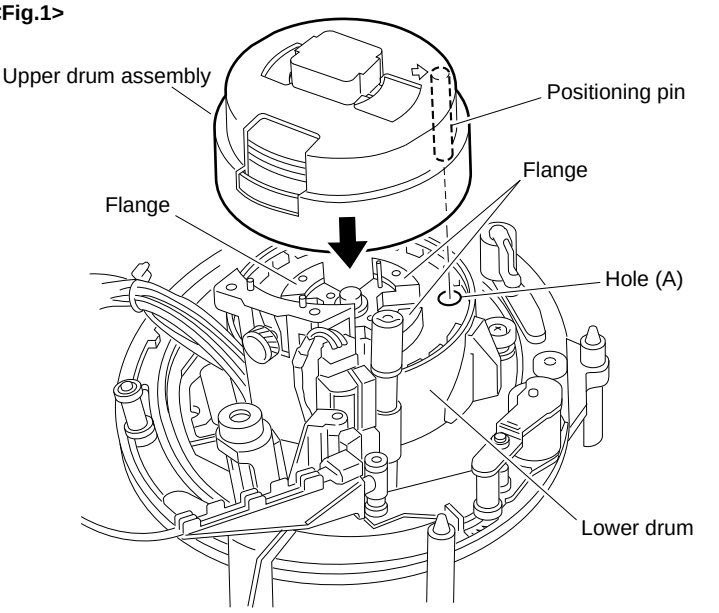
(1) Adjust the position of the hole (A) on DR-293 board with positioning pin on the upper drum cover. (Fig. 1)
(2) Gently put the upper drum assembly on the central shaft of the lower drum while keeping the state of (1).

Notes

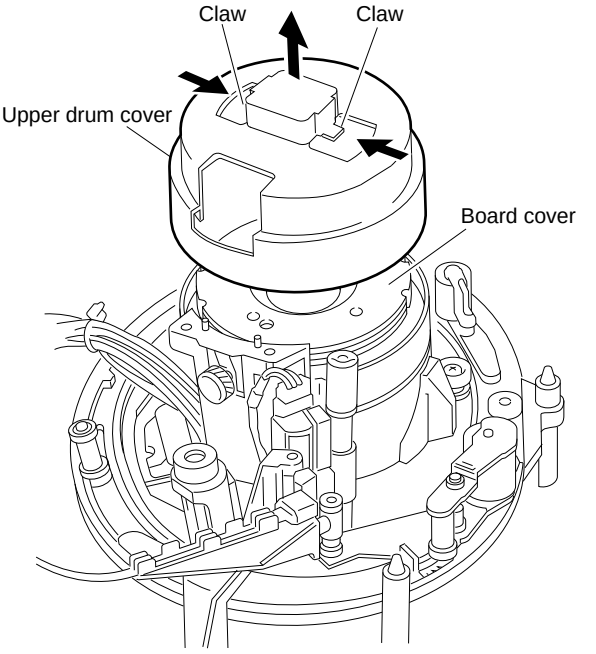
- Never hold the claws of the upper drum cover when installing the upper drum assembly.
- Be careful not to touch the AT head, peripheral tape guides and drum support when installing the upper drum assembly.
- Do not turn the upper drum with the upper drum cover is installed.

(3) Press the claws of the upper drum cover in the direction indicated by the arrows and raise the upper drum cover up, then remove it.
(4) Push the central portion of the upper drum down by finger, and place the upper drum on the flange of the lower drum surely.
(5) Set the torque screwdriver to 39.2×10^{-2} N • m{4.0 kgf • cm}. Put the torque screwdriver in the four holes on the board cover of the upper drum assembly while keeping the state of (4). Tighten the four screws in the sequence shown on the board cover gradually.
(6) Set the torque screwdriver to 58.8×10^{-2} N • m{6.0 kgf • cm}.
Tighten the four screws in the same sequence as in step (5) using a torque screwdriver.

<Fig.1>



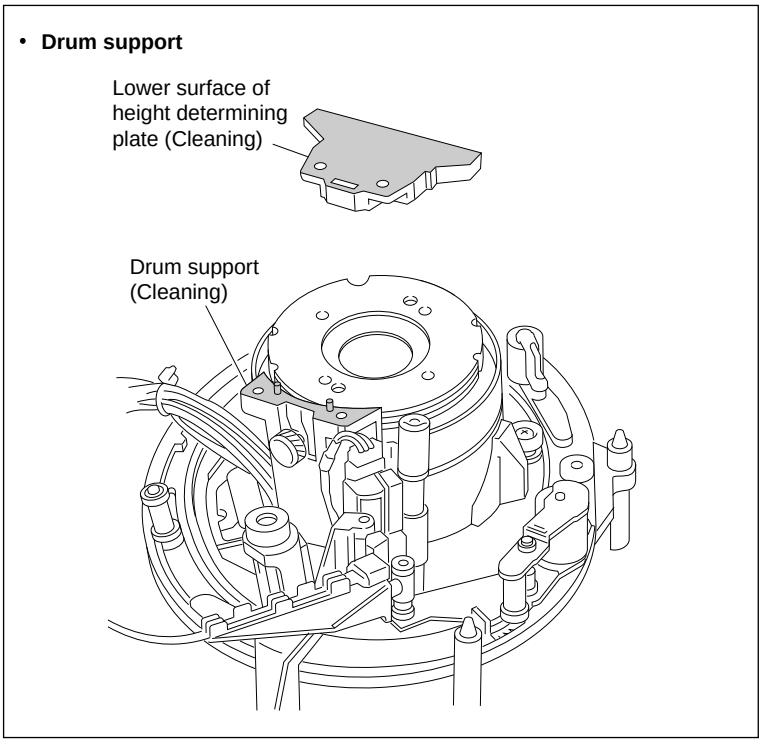
• **Remove the upper drum cover**



Attach the upper Drum Assembly

9. Cleaning

Clean the lower surface (shaded portion in the figure) of the height determining plate and the upper surface of the drum support (shaded portion in the figure) with a soft cloth.



Cleaning

10. Attach the Height Determining Plate

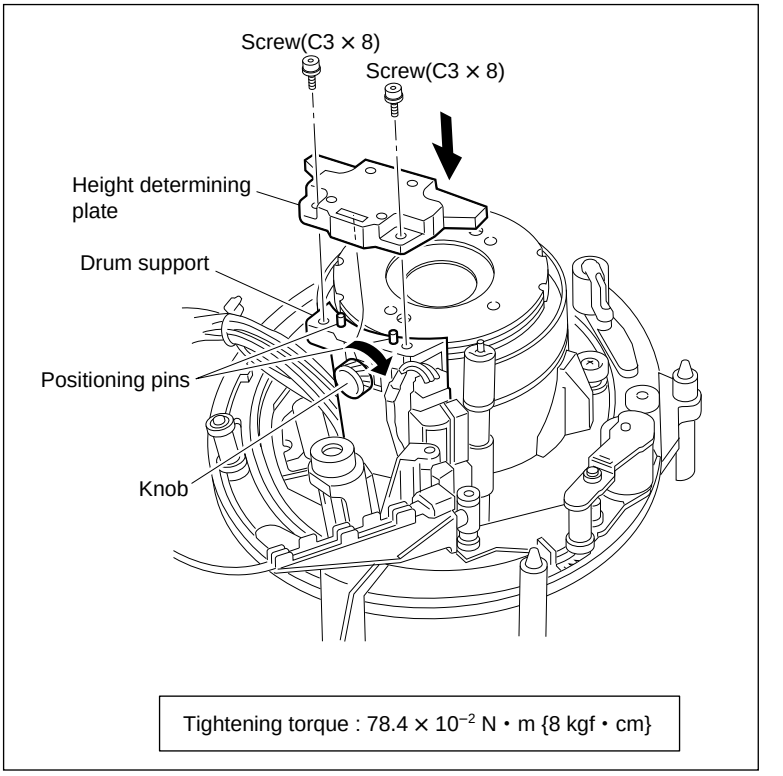
(1) Attach the height determining plate so that the positioning pins of the drum support are put into the holes of the height determining plate.

(2) Alternately and gradually tighten the two screws.

Tightening torque: 78.4×10^{-2} N • m {8 kgf • cm}

11. Put the Demagnetization Head Assembly Back

Turn the knob of the demagnetization head assembly clockwise until it will be stopped.



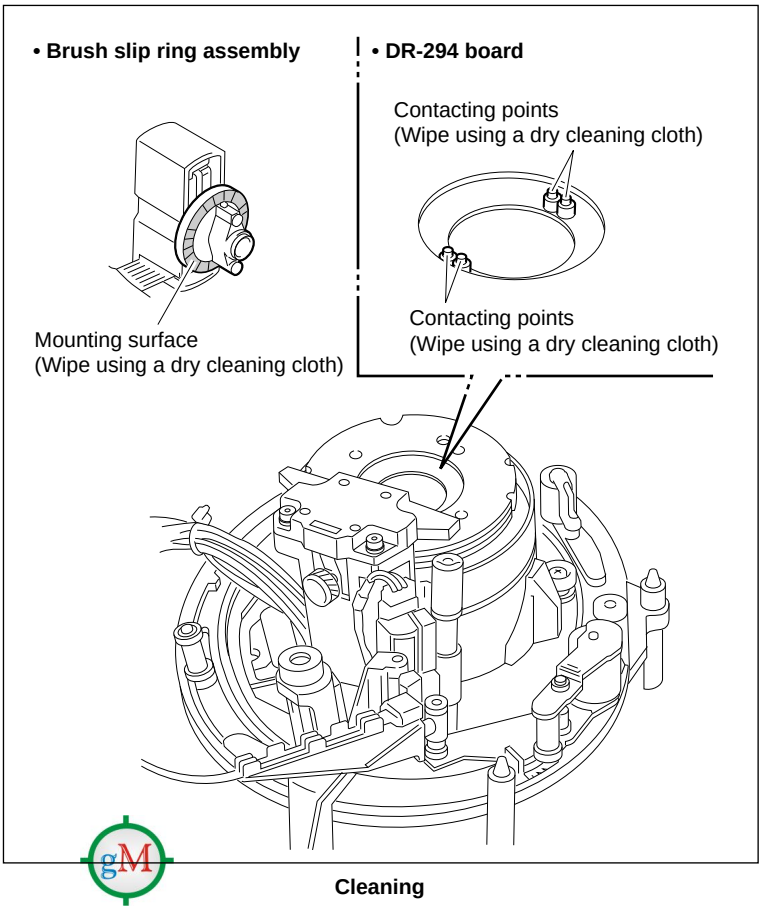
Attach the Height Determining Plate/
Put the Demagnetization Head Aassembly Back

12. Cleaning

Wipe the brush slip ring assembly mounting surface (shaded portion in the figure) and contacting points on the DR-294 board using a dry cleaning cloth.

Notes

- Do not apply cleaning fluid to the contacting points.
- If the screws remain into the screw holes of the brush slip ring assembly, remove them once. When the brush slip ring assembly is turned upside down, these screws may be dropped into the slip ring cover.


• Brush slip ring assembly
• DR-294 board
Contacting points
(Wipe using a dry cleaning cloth)
Mounting surface
(Wipe using a dry cleaning cloth)
Contacting points
(Wipe using a dry cleaning cloth)

Cleaning

13. Attach the Brush Slip Ring Assembly

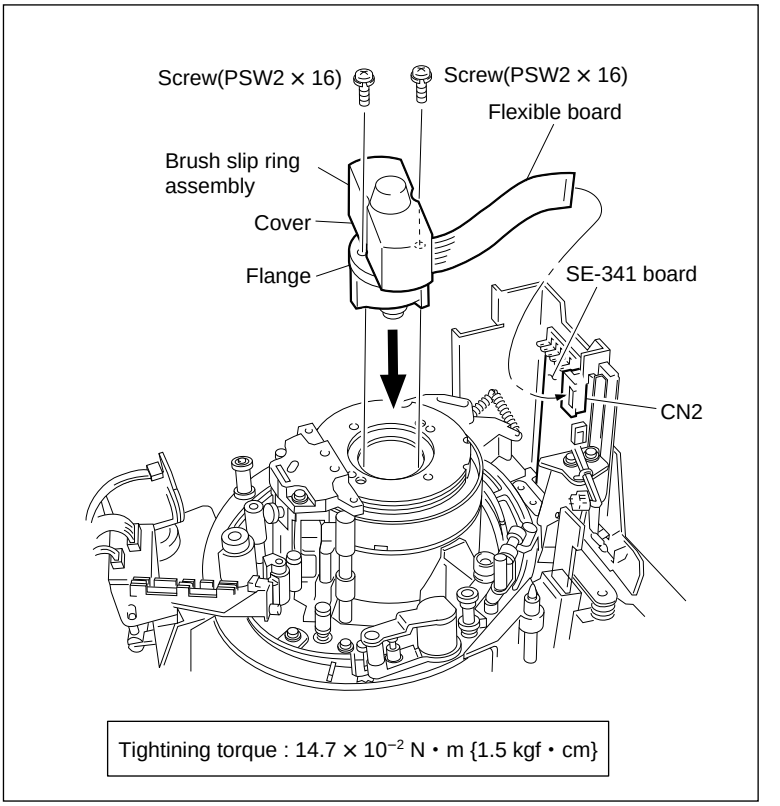
(1) Attach the brush slip ring assembly in the direction shown in the figure.

(2) Alternately and gradually tighten the two screws while equally pushing both sides of the flange from above.

Tightening torque: 14.7×10^{-2} N • m {1.5 kgf • cm}

Note

Never apply excessive force to the cover.



Attach the Brush Slip Ring Assembly

14. Connect the Flexible Board

Connect the flexible board to connector CN2 on the SE-341board.

15. Cleaning

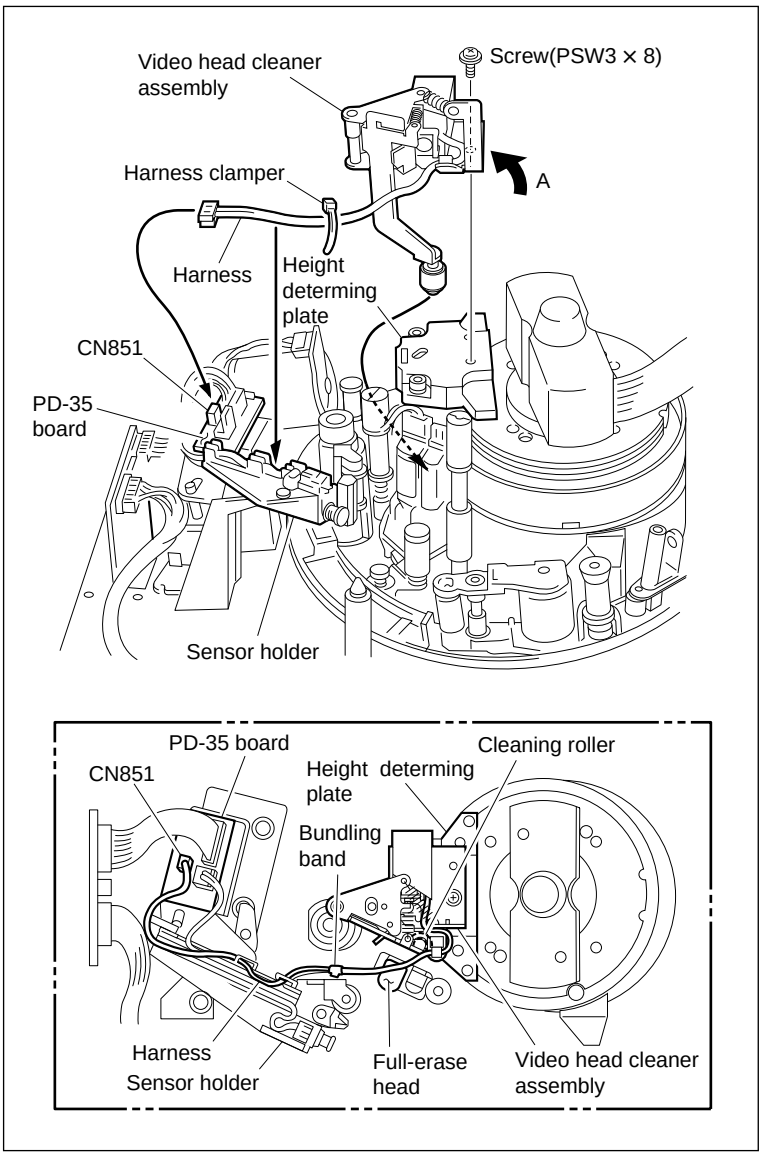
Clean the video heads and tape running surface of the upper drum. (Refer to Section 5-2-3 in Maintenance Manual Part1.)

Note

After cleaning, wipe using a dry cleaning cloth.

16. Attach the Video Head Cleaner Assembly

(1) Insert the cleaning roller into the clearance between the full-erase head and height determing plate as shown in the figure.
(2) Adjust the position of the two pins of the video head cleaner assembly with the two holes of the height determing plate.
(3) Tighten the screw while pushing the video head cleaner assembly in the direction indicated by the arrow A.
(4) Fix the harness to the position on the sensor holder as shown in the figure.
(5) Connect the harness of the video head cleaner assembly to connector CN851 on the PD-35 board.
(6) Bind the two harness of the full-erase head and video head cleaner asembly with a new harness clamper (or the equivalent).
(7) Adjust the position of the cleaning roller. (Refer to step 5 in Section 5-4.)



Attach the Rotary Head Cleaner Assembly

Adjustment after Replacement

17. Confirm the Tape Running

Refer to Section 7-1-2.

18. Confirm the Video Tracking

Refer to Section 7-1-3.

19. Confirm the CTL Head Height

Refer to Section 7-1-4.

20. Adjust the CTL Head Position

Refer to Section 7-1-5.

21. Confirm the AT Head Height

Refer to Section 7-1-6.

22. Confirm the AT Head Azimuth

Refer to Section 7-1-7.

23. Confirm the AT Head Head-to-tape Contact.

Refer to Section 7-1-8.

24. Adjust the AT Head Position

Refer to Section 7-1-9.

25. Perform the Electrical Adjustments after Drum Replacement

Refer to Section 6.

5-3. Drum Assembly Replacement

As for replacement time, refer to “Section 5. Periodic Maintenance and Inspection” in Maintenance Manual Part 1.

Outline

Replacement

1. Remove the Video Head Cleaner Assembly
2. Disconnect the Flexible Board (CN2/SE-341 Board)
3. Remove the Drum Assembly
4. Cleaning (Drum Assembly Mounting Surfaces and Chassis Mounting Surfaces)
5. Attach the Drum Assembly
6. Connect the Flexible Board (CN2/SE-341 Board)
7. Cleaning (Rotary Heads, Upper Drum’s Tape Running Surface, and Lower Drum’s Tape Running Surface)
8. Attach the Video Head Cleaner Assembly

Adjustment after Replacement

9. Confirm the Drum Motor Function (Refer to Section 4-2 in Maintenance Manual Part 1.) (“C015: DRUM MOTOR”)
10. Confirm the Tape Running (Refer to Section 7-1-2.)
11. Adjust the Video Tracking (Refer to Section 7-1-3.)
12. Adjust the CTL Head Height (Refer to Section 7-1-4.)
13. Adjust the CTL Head Position (Refer to Section 7-1-5.)
14. Adjust the AT Head Height (Refer to Section 7-1-6.)
15. Adjust the AT Head Azimuth (Refer to Section 7-1-7.)
16. Confirm the AT Head Head-to-Tape Contact (Refer to Section 7-1-8.)
17. Adjust the AT Head Position (Refer to Section 7-1-9.)
18. Confirm the Audio Level in REV Mode (Refer to Section 7-1-10.)
19. Confirm the Tape Running (Refer to Section 7-1-2.)
20. Perform the Electrical Adjustment after Drum Replacement (Refer to Section 6.)

Note

Be careful not to damage the AT head and peripheral tape guides when removing or installing the drum assembly.

Basic knowledge

Replace the drum assembly in the following cases.

- The upper or lower drum’s tape running surface is damaged and cannot be repaired.
- A correct RF signal waveform cannot be obtained due to the worn upper or lower drum even if the tracking adjustment is performed.
- The VTR performance deteriorates because of the noise or jitter caused by the bearing life.

Preparation

1. Turn the power off.
2. Remove the Upper lid. (Refer to Section 2-3-1 in Maintenance Manual Part1.)
3. Remove the plate MD assembly.
   (Refer to Section 2-4 in Maintenance Manual Part1.)
4. Remove the cassette compartment.
   (Refer to Section 2-5 in Maintenance Manual Part1.)

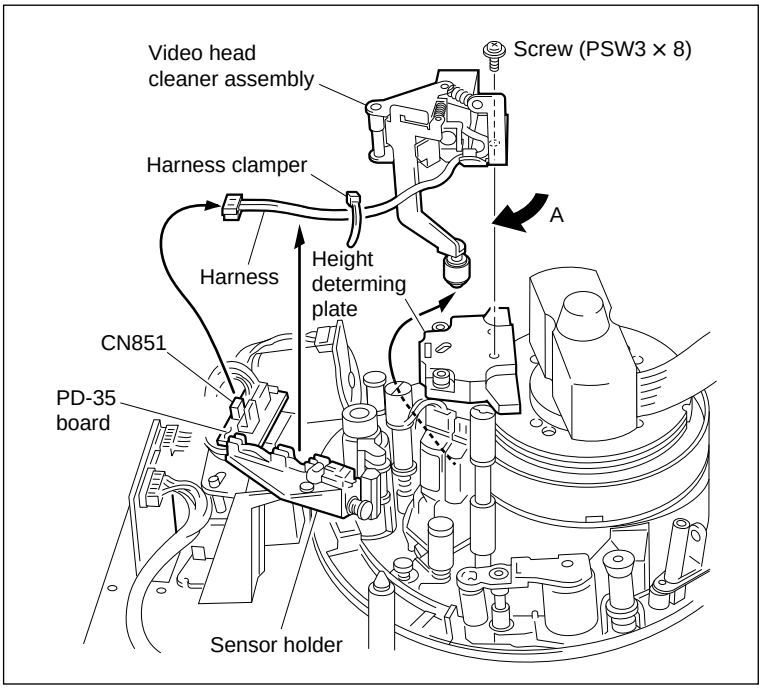
Tools

- Hexagonal wrench driver (2.5 mm): 7-700-766-04
- Torque screwdriver (6 kg•cm)(JB-5251): J-6252-510-A
- Torque screwdriver (12 kg•cm)(JB-5252): J-6252-520-A
- Torque screwdriver's hexagonal bit (d=2.5 mm, l=120 mm): J-6251-090-A
- Cleaning cloth: 3-184-527-01
- Cleaning fluid: 9-919-573-01

Removal

1. Remove the Video Head Cleaner Assembly

(1) Disconnect the harness from connector CN851 on the PD-35 board.
(2) Cut the harness clamper.
(3) Remove the harness from the sensor holder.
(4) Remove the screw, shift the video head cleaner assembly in the direction indicated by the arrow A, and remove it from the height determing plate.



Remove the Rotary Head Cleaner Assembly

2. Disconnect the Flexible Board

Disconnect the flexible board from connector CN2 on the SE-341 board.

3. Remove the Drum Assembly

(1) Remove the harness of the demagnetization head assembly from the harness rail, then disconnect the connect.

(2) Rotate the upper drum assembly manually counterclockwise and adjust the dented portion on the board cover with the lower drum fixing screw as shown in the figure.

Note

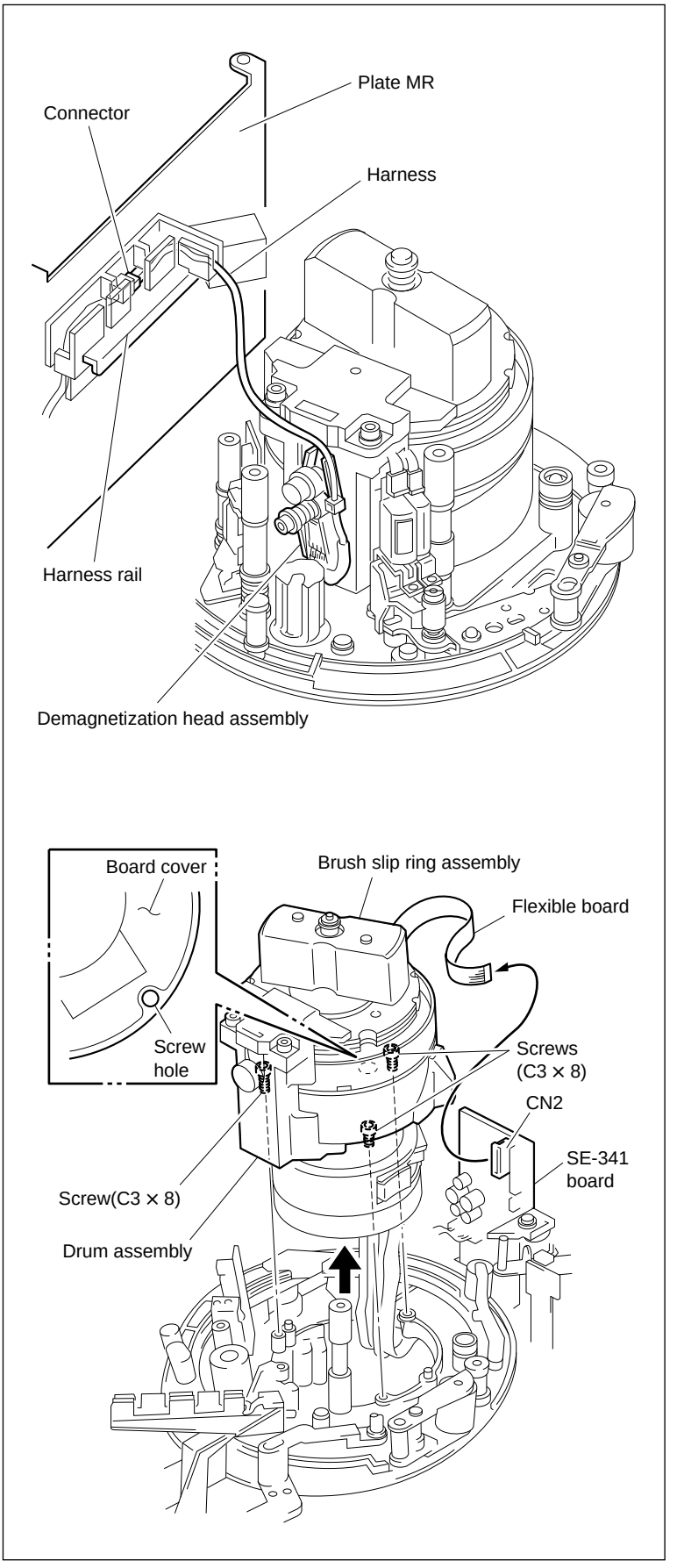
The drum assembly is fixed to the chassis with the three fixing screws (C3 × 8) in the screw hole.

(3) Fully loosen the screw using a hexagonal wrench driver.

Note

These screws cannot be removed because of stoppers.

(4) Rotate the upper drum counterclockwise by finger and fully loosen other two screws in the same way as in steps (2) and (3).



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(5) Raise the drum assembly just above and remove the two harnesses from the harness holders at the bottom.

Note

Be careful not to raise the drum assembly by holding the brush slip ring assembly.

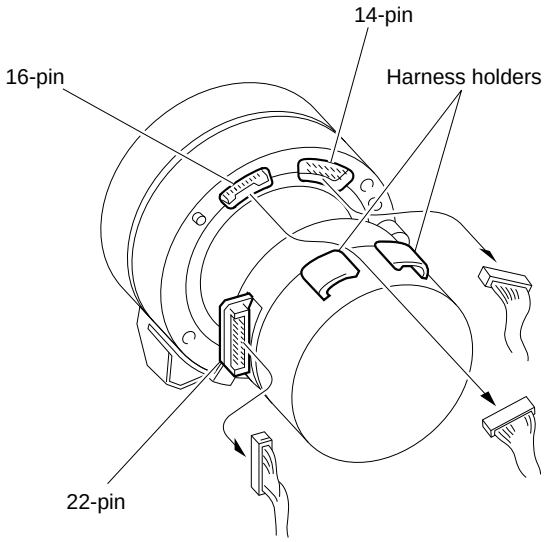
(6) Disconnect the three harnesses in the state of step (5). Then the drum assembly can be removed.

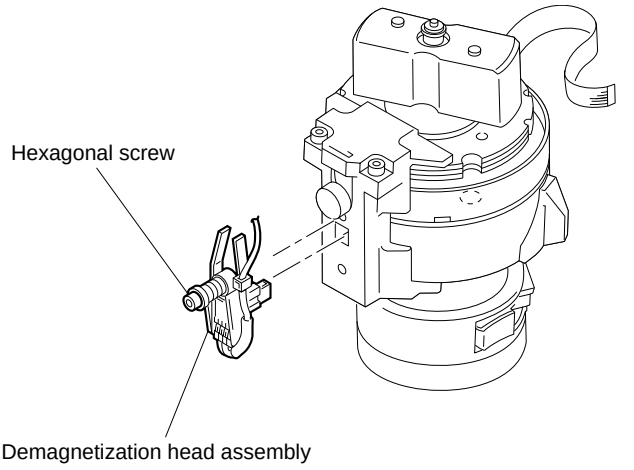
Note

Be careful not to touch the AT head and peripheral tape guides when removing the drum assembly.

(7) Loosen the hexagonal screw, then remove the demagnetization head assembly from the drum assembly.

• Disconnect the connectors





Remove the Drum Assembly

Installation

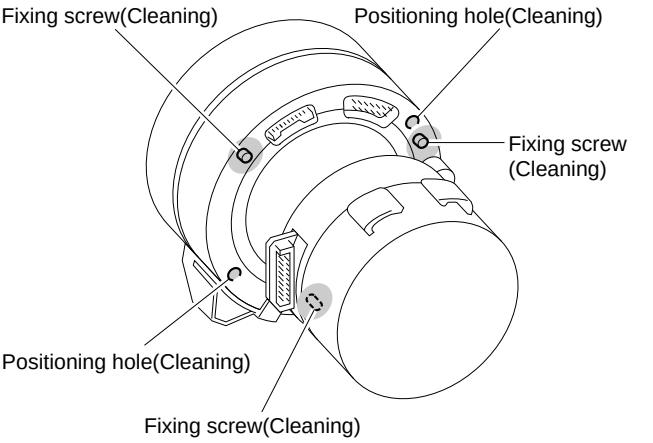
4. Cleaning

Clean a new drum assembly mounting surfaces and chassis mounting surfaces using a cleaning cloth moistened with cleaning fluid.

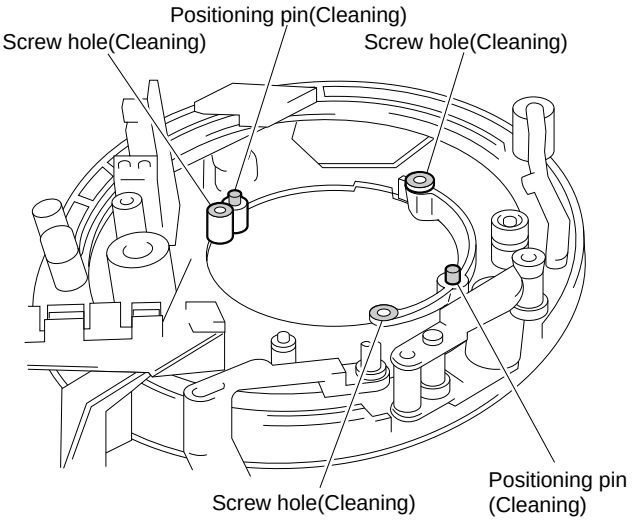
Note

After cleaning, wipe using a dry cleaning cloth.

• Drum assembly



• Chassis



Cleaning

5. Attach the Drum Assembly

(1) Confirm that there is no clearance between the spacer and the washer of the demagnetization head assembly. (If clearance exists, tighten the hexagonal screw.)
Then insert the demagnetization head into the hole of the drum support, and tighten the hexagonal screw.

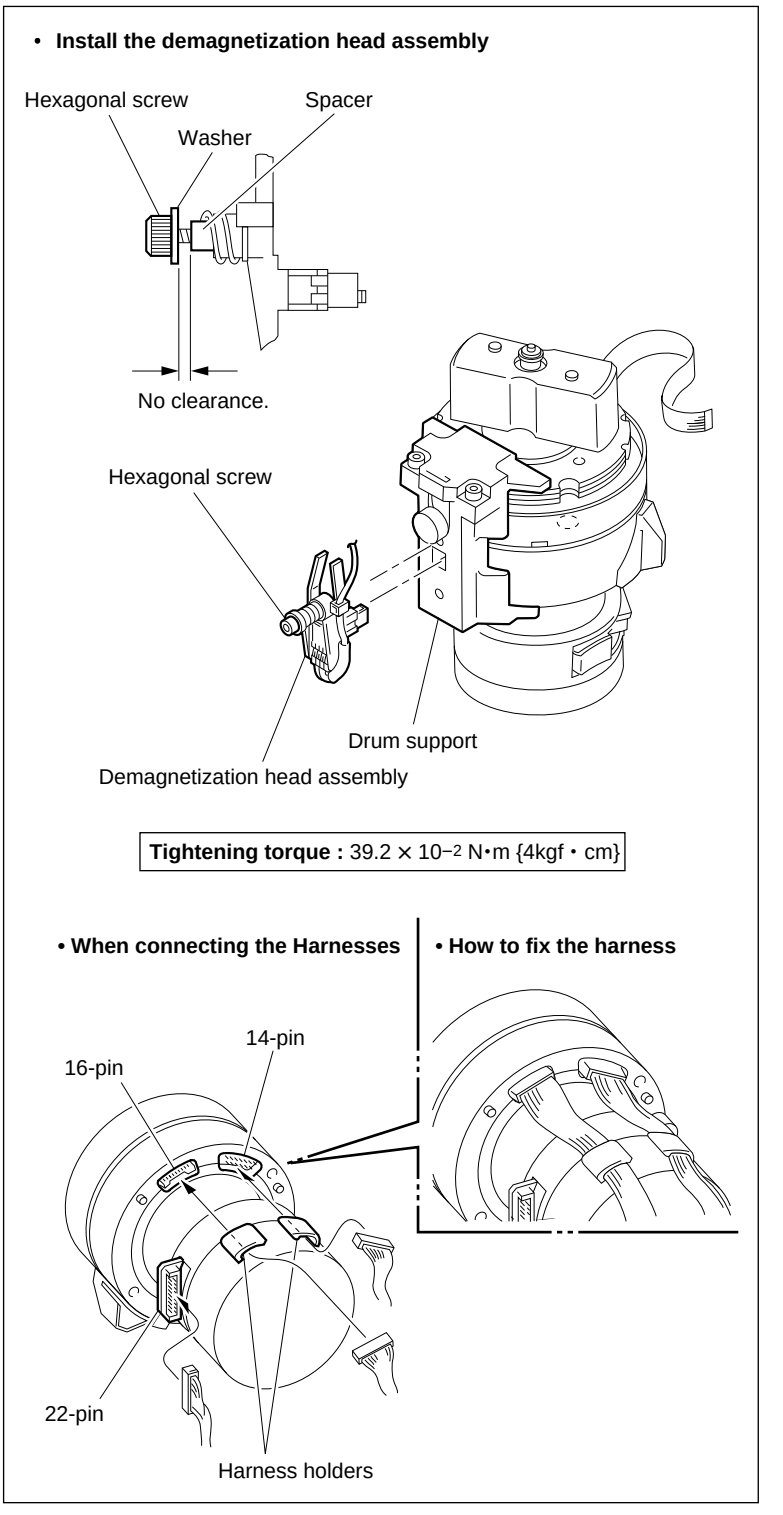
Tightening torque: 39.2×10^{-2} N • m
{4 kgf • cm}

(2) Hold the drum support and connect the three connectors disconnected in (6) of step 3.

Notes

- Hold the height determining plate and the drum support at that time. Be careful not to hold the upper drum and the brush slip ring assembly.
- Pay attention to the direction of the connectors.

(3) Fix each of the two harnesses with the harness holder as shown in the figure.



Attach the Drum Assembly

(4) Adjust the two positioning holes of the drum assembly with the two positioning pins of the chassis, and install it to the chassis while passing the harnesses under the chassis.

Notes

- Be careful not to touch the AT head and tape guide at that time.
- Be careful not to put the harness between the lower drum and the chassis.

(5) Confirm that the drum assembly is firmly inserted into the positioning pins.
(6) Rotate the upper drum assembly manually counterclockwise and position the screw hole of the upper drum assembly with the dented portion.
(7) Temporary tighten the screw.
(8) Temporary tighten other two screws in the same way as in steps (6) and (7).
(9) Gradually tighten the three screws in the order of counterclockwise.

Tightening torque: 78.4×10^{-2} N • m
{8 kgf • cm}

(10) Connect the harness of the demagnetization head assembly to the connector on the harness rail, then clamp it in the harness rail as shown in the figure.

6. Connect the Flexible Board

Connect the flexible board to connector CN2 on the SE-341 board, then lock.

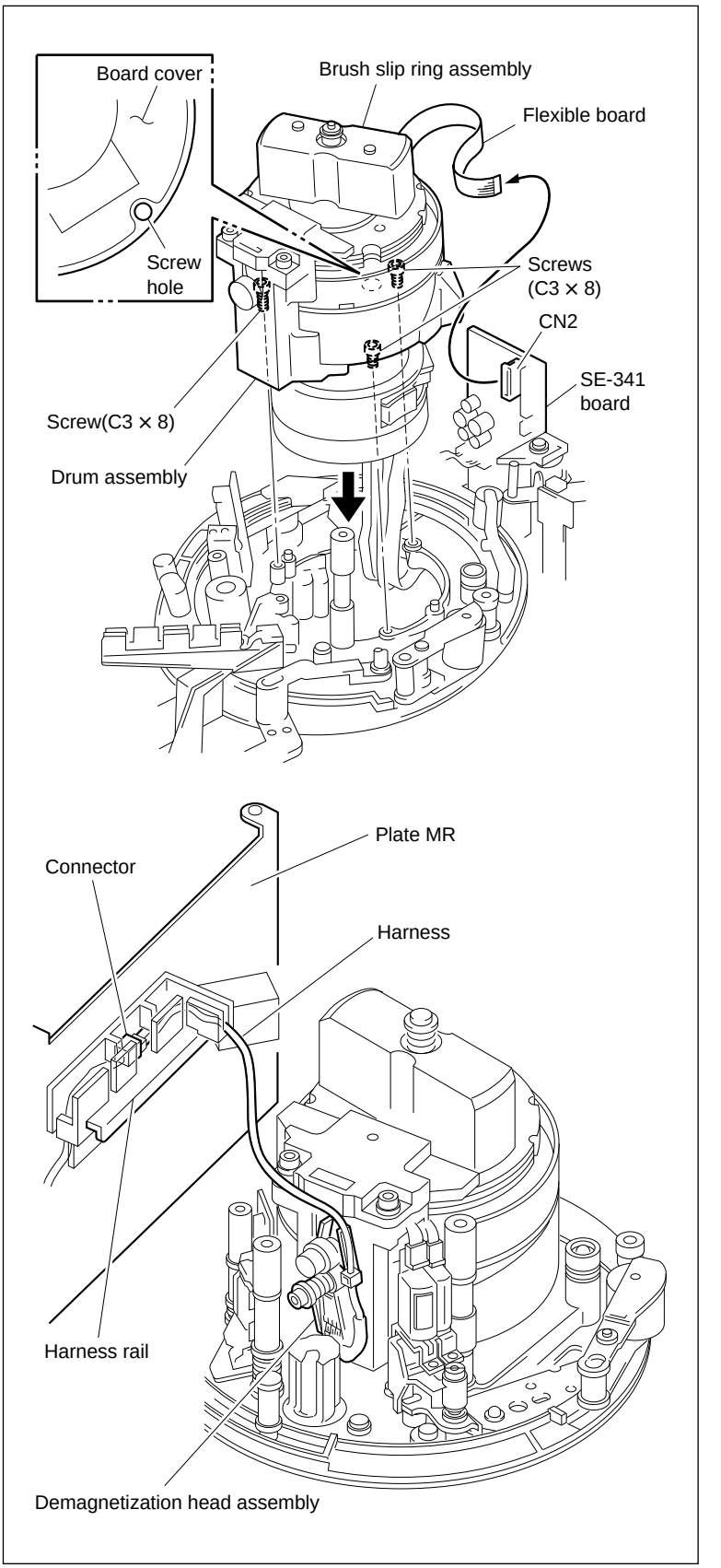
7. Cleaning

Clean the portions below.

- Rotary heads (Refer to Section 5-2-3 in Maintenance Manual Part 1.)
- Lower drum's tape running surface (Refer to Section 5-2-4 in Maintenance Manual Part 1.)

Note

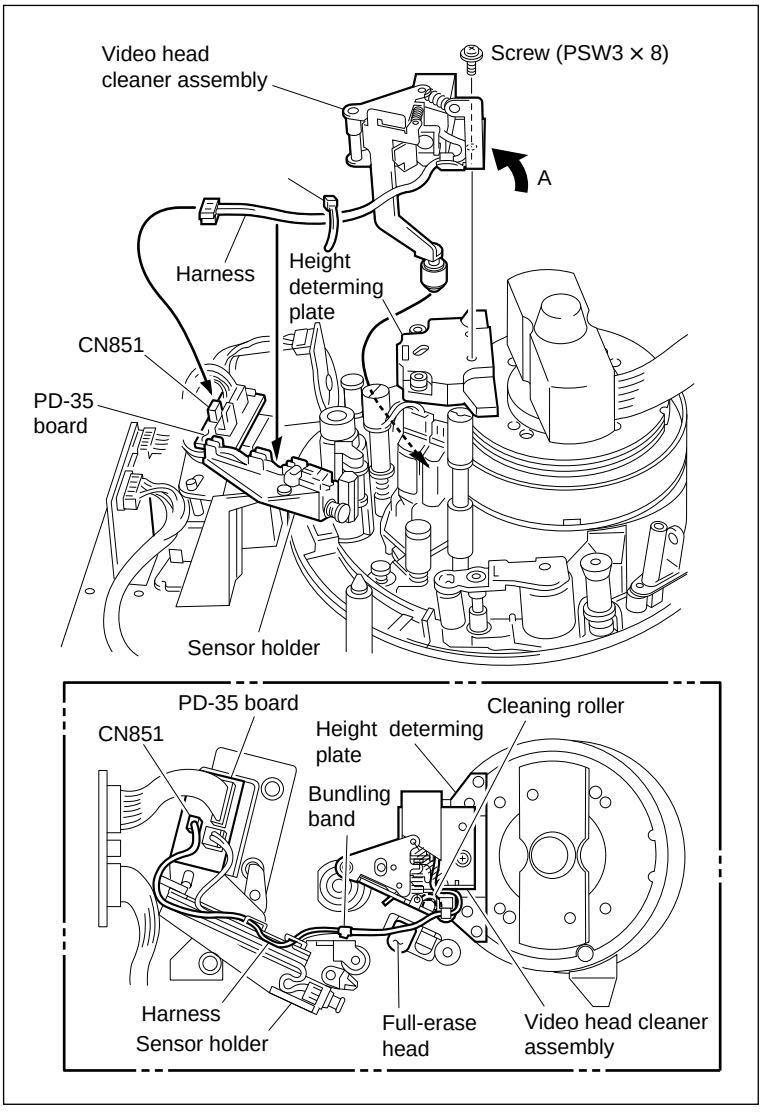
After cleaning, wipe using a dry cleaning cloth.



Attach the Drum Assembly

8. Attach the Video Head Cleaner Assembly

(1) Insert the cleaning roller into the clearance between the height determing plate and full erase head as shown in the figure.
(2) Adjust the position of the two pins of the video head cleaner assembly with the two holes of the height determing plate.
(3) Tighten the screw while pushing the video head cleaner assembly in the direction indicated by the arrow A.
(4) Fix the harness to the position on the sensor holder as shown in the figure.
(5) Connect the harness of the video head cleaner assembly to connector CN851 on the PD-35 board.
(6) Bind the two harnesses of the full-erase head and video head cleaner assembly with a new harness clamper.
(7) Adjust the position of the cleaning roller. (Refer to step 5 in Section 5-4.)



Attach the Video Head Cleaner Assembly

Adjustment after Replacement

9. Confirm the Drum Motor Function
Refer to Section 4-2 in Maintenance Manual Part 1. (C015: DRUM MOTOR)

10. Confirm the Tape Running
Refer to Section 7-1-2.

11. Adjust the Video Tracking
Refer to Section 7-1-3.

12. Adjust the CTL Head Height
Refer to Section 7-1-4.

13. Adjust the CTL Head Position
Refer to Section 7-1-5.

14. Adjust the AT Head Height
Refer to Section 7-1-6.

15. Adjust the AT Head Azimuth
Refer to Section 7-1-7.

16. Confirm the AT Head Head-to-Tape Contact
Refer to Section 7-1-8.

17. Adjust the AT Head Position
Refer to Section 7-1-9.

18. Confirm the Audio Level in REV Mode
Refer to Section 7-1-10.

19. Confirm the Tape Running
Refer to Section 7-1-2.

20. Perform the Electrical Adjustment after Drum Replacement
Refer to Section 6.

5-4. Cleaning Roller and Video Head Cleaner Assembly Replacement

Replace the cleaning roller every 6,000 hours of the drum rotating.*
Replace the video head cleaner assembly ealier time either 6,000 hours of the drum rotating or 200,000 times of the threading.
The cleaning roller is included in the video head cleaner assembly.
*: The cleaning roller is countermeasured to the long-life characteristics. When replacing, be sure to replace this new parts described in this section.

Outline

Replacement

1. Remove the Harness (CN851/PD-35 Board)
2. Remove the Video Head Cleaner Assembly
3. Replace the Cleaning Roller
4. Attach the Video Head Cleaner Assembly
5. Adjust the Cleaning Roller Position
6. Connect the Harness (CN851/PD-35 Board)

Adjustment after Replacement

7. Confirm the Cleaning Solenoid Operation (Refer to Section 4-2-2 in Maintenance Manual Part 1.)
   (C023: CLEANING ROLLER)

Note

When the cleaning roller is replaced, it is recommended to replace the CR spacer at the same time.
CR spacer : 3-182-765-02

Preparation

1. Turn the power off.
2. Remove the upper lid. (Refer to Section 2-3-1 in Maintenance Manual Part1.)
3. Remove the plate MD assembly.
   (Refer to Section 2-4 in Maintenance Manual Part1.)
4. Remove the cassette compartment.
   (Refer to Section 2-5 in Maintenance Manual Part1.)

Removal

1. Remove the Harness

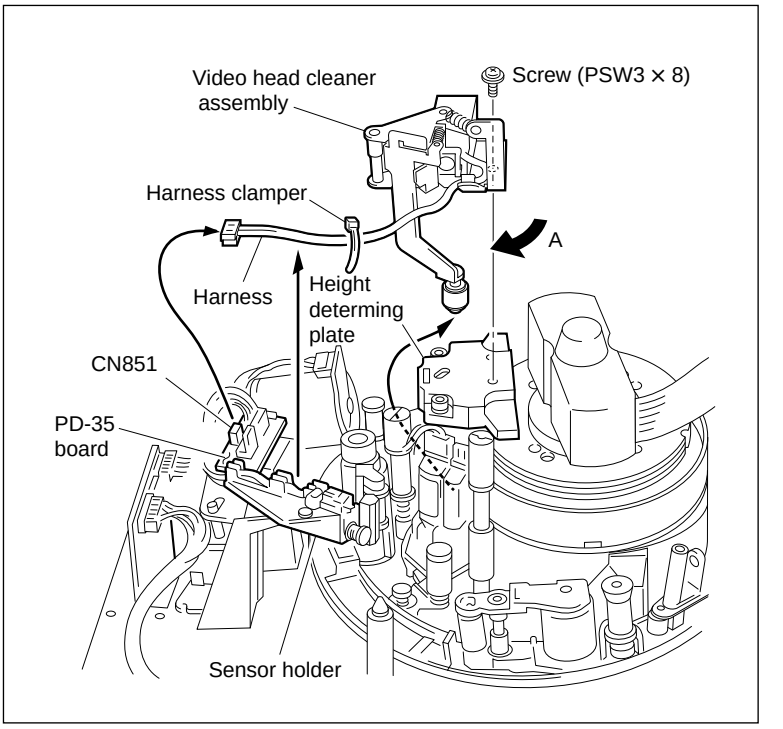
(1) Disconnect the harness from connector CN851 on the PD-35 board.
(2) Cut the harness clamper.
(3) Remove the harness from the sensor holder.

2. Remove the Video Head Cleaner Assembly

Remove the screw, shift the video head cleaner assembly in the direction indicated by the arrow A, and remove it from the height determing plate.

Note

Perform step 5 and later when replacing the video head cleaner assembly.
Perform step 3 and later when replacing the cleaning roller.



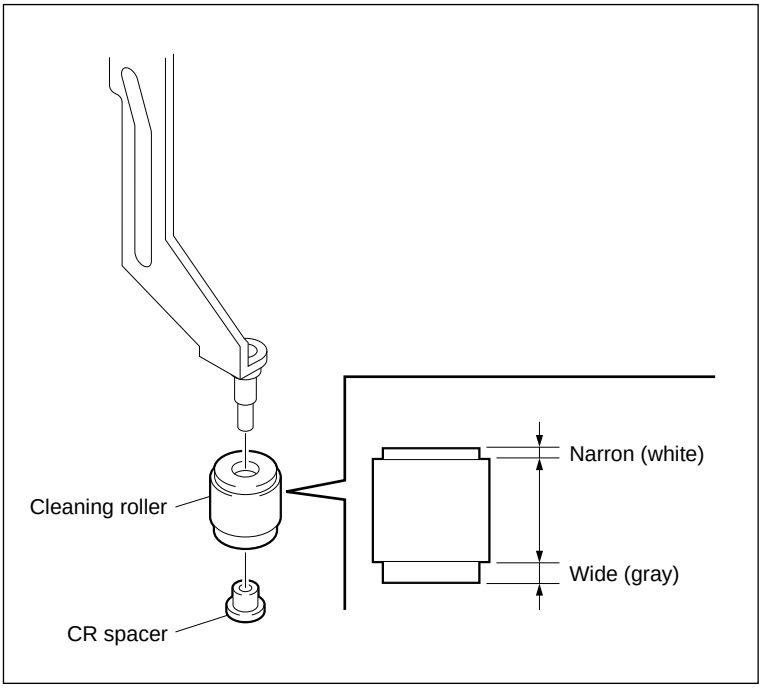
Remove the Video Head Cleaner Assembly

3. Replace the Cleaning Roller

(1) Remove the CR spacer, and remove the cleaning roller.
(2) Pass a new cleaning roller through the shaft as shown in the figure. Then fix the cleaning roller by new CR spacer.
(3) Move the cleaning roller in the vertical direction.
At this time, confirm that there is no vertical play.

Note

If the cleaning roller is installed upside down, the positional relationship between the cleaning roller and video heads may be shifted. Be sure to keep the installing direction.

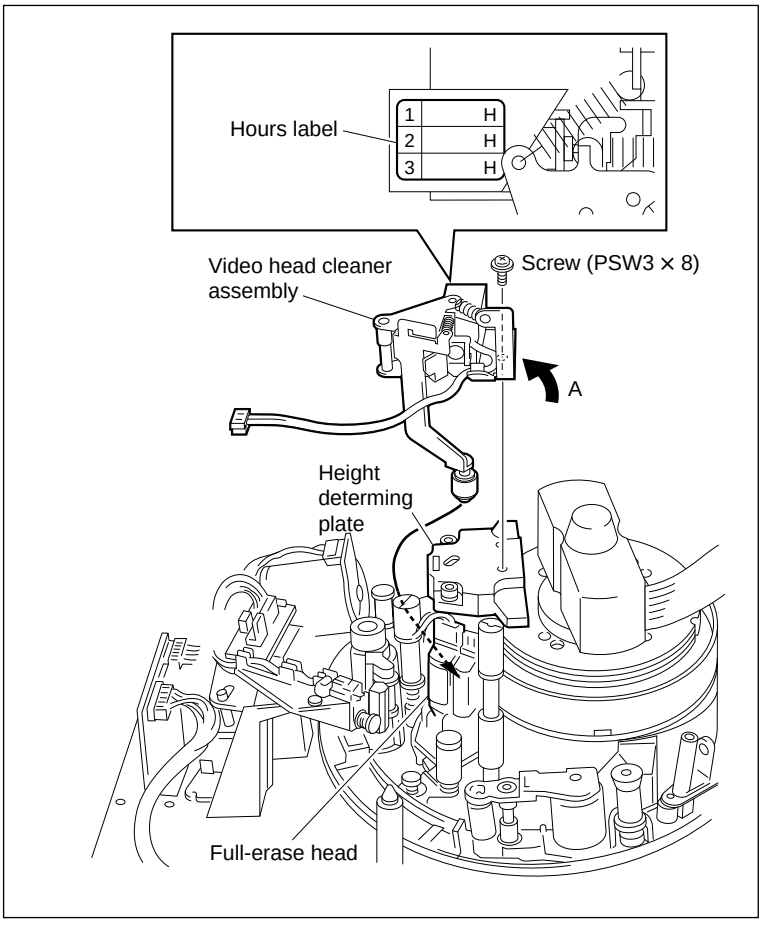


Replace the Cleaning Roller

Installation

4. Attach the Video Head Cleaner Assembly

(1) Insert the cleaning roller from the clearance between the height determing plate and the full-erase head.
(2) Align the two pins of the video head cleaner assembly with the two holes of the height determing plate.
(3) Tighten the screw while moving the video head cleaner assembly in the direction indicated by the arrow A (counterclookwise).
(4) Fill in the hours of the cleaning roller replacement on the hours label sticked on the video head cleaner assembly.



Attach the Video Head Cleaner Assembly

5. Adjust the Cleaning Roller Position

(1) Check that the cleaning roller does not come in contact with the upper drum as visual. (Specification 1)

If the cleaning roller comes in contact with the upper drum, bend the portion B of the arm bracket assembly in the direction of the arrow C.

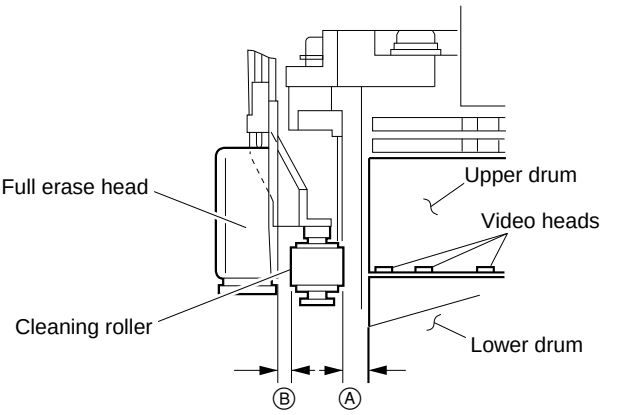
(2) Check that the cleaning roller does not come in contact with the terminal on the full erase head as visual. (Specification 2)

If the cleaning roller comes in contact with the terminal on the full erase head, bend the portion B of the arm bracket assembly in the direction of the arrow D.

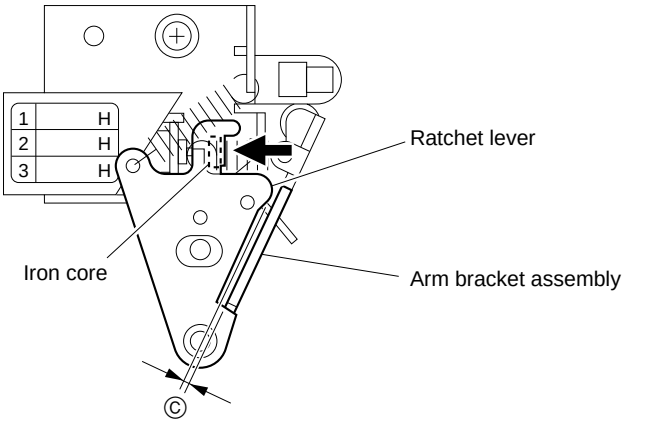
(3) Press the iron core in the direction of the arrow. At that time, check that clearance exists between the ratchet lever and the arm bracket assembly. (Specification 3)

If clearance does not exist, bend the portion B of the arm bracket assembly in the direction of the arrow D.

(4) Repeat steps (1) through (3) above until the specifications 1 through 3 are satisfied.

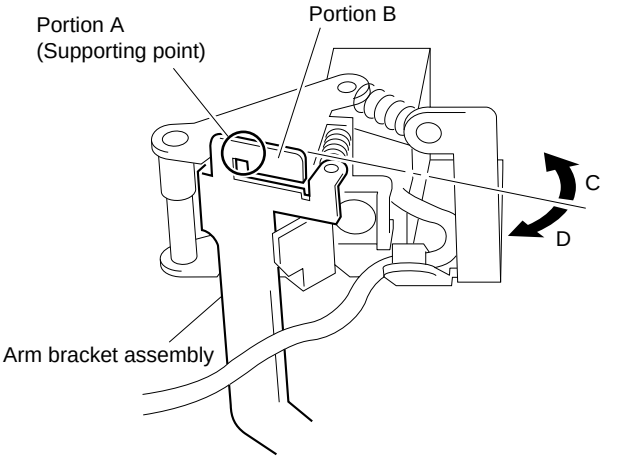


Spec. 1: Ⓐ = Clearance exists.
Spec. 2: Ⓑ = Clearance exists.



Spec.3: Ⓒ = Clearance exists.

• When the specifications 1or 2 are not satisfied.



Adjust the Cleaning Roller Position

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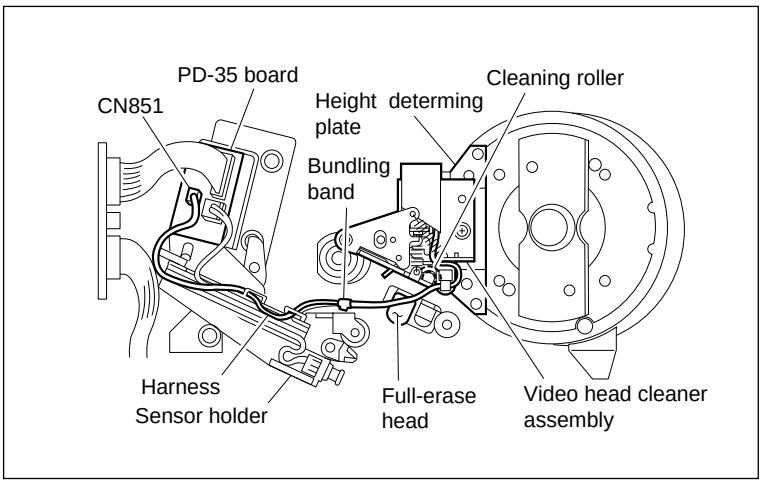
6. Connect the Harness

(1) Fix the harness to the position on the sensor holder as shown in the figure.
(2) Connect a harness of the video head cleaner assembly to connector CN851 on the PD-35 board.
(3) Bind the two harness of the video head cleaner assembly and the full-erase head with a new harness clamper (or equivalent).



Connect the Harness

Adjustment after Replacement

7. Confirm the Cleaning Solenoid Operation

Refer to Section 4-2-2 in Maintenance Manual Part 1.
(C023: CLEANING ROLLER)

5-5. AT Head Cleaner Replacement

Replace the AT head cleaner every 2,000 hours of drum rotating.

Outline

Replacement

1. Remove the CL Arm Assembly
2. Attach the CL Arm Assembly
3. Confirm the CL Arm Assembly Operation

Note

1. When the cleaning roller is dirty or damaged, replace the CL arm assembly.
2. Adjustment after the CL arm assembly replacement is not required. However, confirm the CL arm assembly operation.
3. When replacing the AT head cleaner, prepare a new stop washer.
   Stop washer (2.3) : 3-669-596-00

Preparation

1. Turn the power off.
2. Remove the upper lid. (Refer to Section 2-3-1 in Maintenance Manual Part 1.)
3. Remove the plate MD assembly.
   (Refer to Section 2-4 in Maintenance Manual Part 1.)
4. Remove the cassette compartment.
   (Refer to Section 2-5 in Maintenance Manual Part 1.)

Removal

1. Remove the CL Arm Assembly

(1) Turn the M gear of the gear box assembly manually and move the CL arm assembly to the position shown in the figure.

Note

Move the CL arm assembly to the front of the SE-341 board. If not, the CL arm assembly cannot be removed because the stop washer is hidden by other parts.

(2) Remove the stop washer at the top of the CL arm assembly.

(3) Remove the CL arm assembly from the threading ring.

Note

Do not remove the spring at the bottom of the CL arm from the shaft.

Installation

2. Attach the CL Arm Assembly

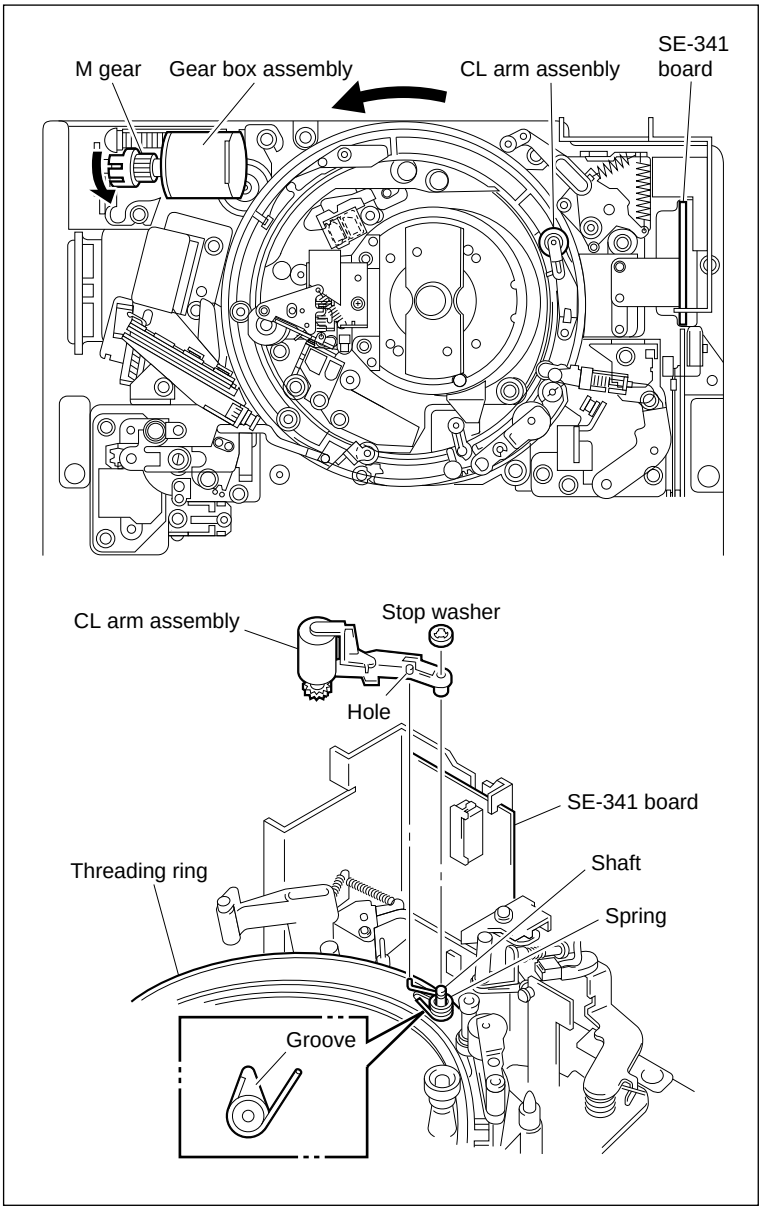
(1) Pass a new CL arm assembly through the shaft while hooking the spring as shown in the figure.

Note

Insert the short-end of the spring into the groove of the threading ring and the long-end spring into the hole of the CL arm assembly.

(2) Fix the CL arm assembly by new stop washer.

Stop washer (2.3) : 3-669-596-00



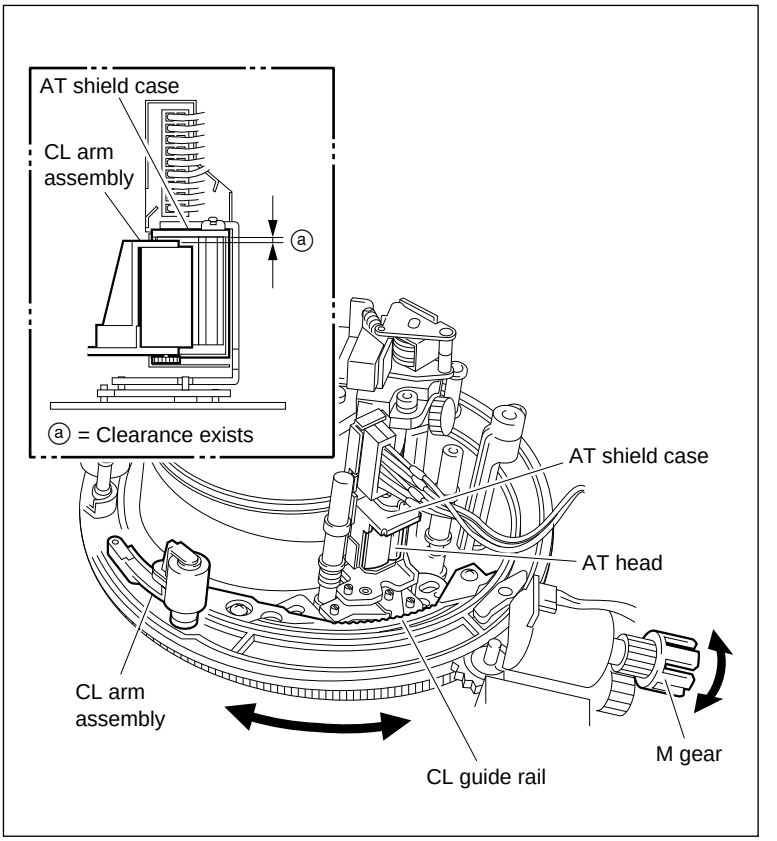
Remove the CL Arm Assembly

3. Confirm the CL Arm Assembly Operation

(1) Turn the M gear of the gear box assembly manually and confirm the items below while repeating the threading and unthreading.

- The CL arm assembly moves along the CL guide rail.
- The cleaning roller cleans the AT head.
- A clearance exists between the CL arm assembly and shield case while the AT head is cleaned.

(2) Turn the power on and confirm that the CL arm assembly smoothly operates while repeating the threading and unthreading.



Confirm the CL Arm Assembly Operation

5-6. Air Filter Replacement

Replace the air filter every 6,000 hours of the air filter use.

Outline

1. Remove the Air Filter
2. Install the Air Filter

Note

Never reuse the air filter used over 6,000 hours.

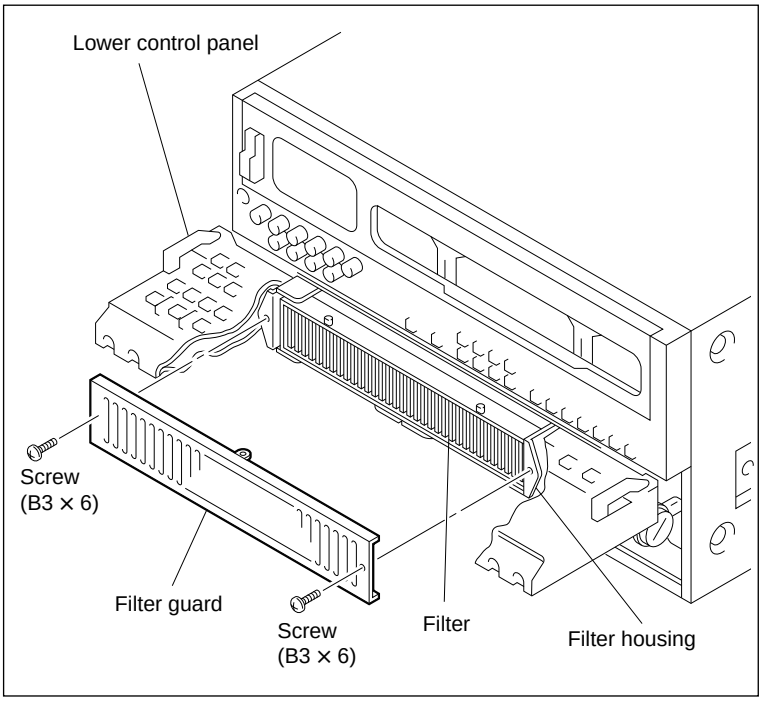
Preparation

1. Turn the power off.

Removal

1. Remove the Air Filter

(1) Turn the lower control panel up as shown in the figure.
(2) Remove the two screws and remove the filter guard.
(3) Push the air filter out using fingers from the filter housing.
Two holes are on the both sides of the filter housing.



Remove the Air Filter

Installation

2. Attach the Air Filter

(1) Wipe the filter guard and the filter housing using a soft cloth.

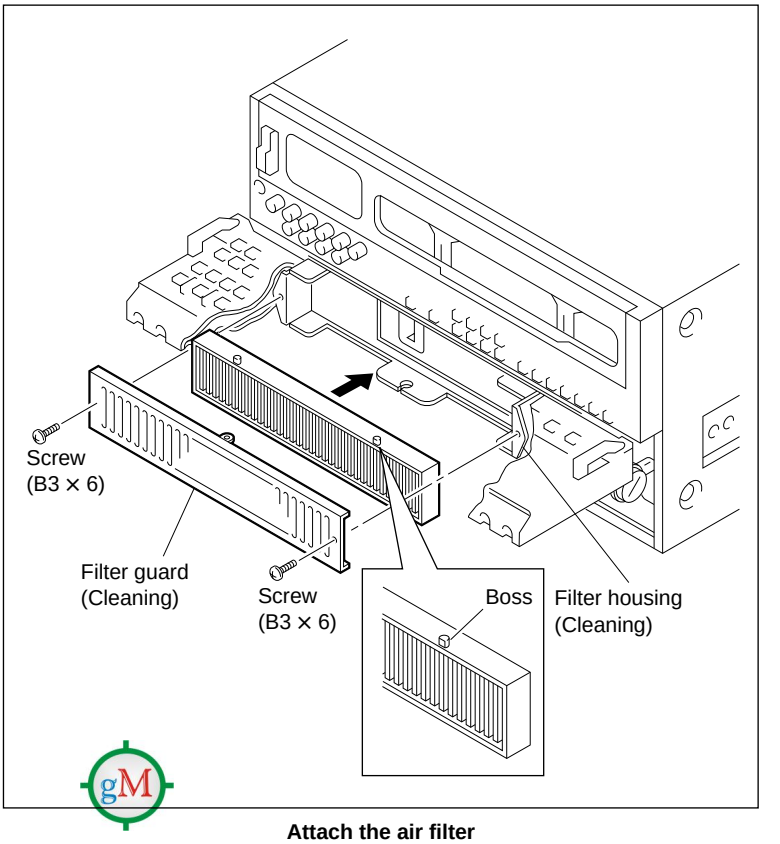
(2) Put new air filter into the filter housing such as the semicircular bosses are faced to the front side.

Note

The air filter has same shapes with the upper side and the lower one.

(3) Attach the filter guard with the two screws.

(4) Turn the lower control panel back where it was.



Attach the air filter

5-7. Pinch Roller Replacement

Replace the pinch roller every 2,000 hours of the tape running.

Outline

Replacement

1. Remove the Pinch Arm Assembly
2. Attach the Pinch Arm Assembly
3. Adjust the Pinch Arm Assembly Vertical Play
4. Cleaning (Pinch Roller Surface)

Adjustment after Replacement

5. Confirm the Tape Running (Refer to Section 7-1-2.)
6. Confirm the AT Head Height (Refer to Section 7-1-6.)
7. Confirm the AT Head Azimuth (Refer to Section 7-1-7.)

Notes

1. When the pinch roller is damaged or worn, replace the pinch roller assembly.
2. When replacing the AT head cleaner, prepare a new stop washer.
   Stop washer (2.3) : 3-669-596-00

Preparation

1. Turn the power off.
2. Remove the upper lid. (Refer to Section 2-3-1 in Maintenance Manual Part 1.)
3. Remove the plate MD assembly.
   (Refer to Section 2-4 in Maintenance Manual Part 1.)
4. Remove the cassette compartment.
   (Refer to Section 2-5 in Maintenance Manual Part 1.)

Tools

- Thickness gauge: 9-911-053-00
- Cleaning cloth: 3-184-527-01
- Cleaning fluid: 9-919-573-01

Removal

1. Remove the Pinch Arm Assembly

(1) Remove the stop washer at the top of the pinch arm.

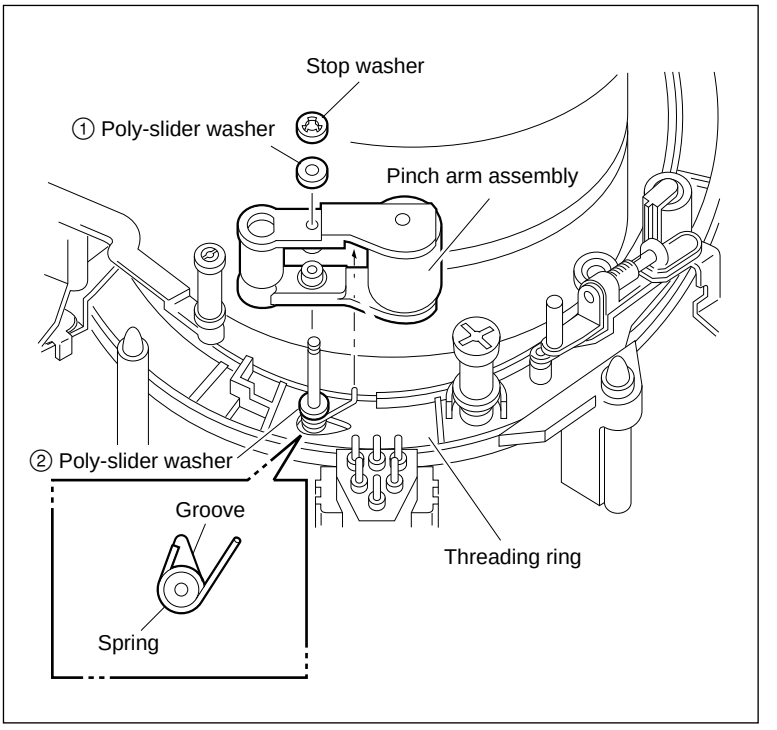
Note

If a poly-slider washer ① is inserted between the pinch arm assembly and the stop washer, be carefull not to lose the poly-slider washer. This poly-slider washer is used for vertical play adjustment.

(2) Remove the pinch arm assembly from the threading ring.

Note

Do not remove the poly-slider washer ② and spring at the bottom of the pinch arm assembly from the shaft.



Remove/Attach the Pinch Arm Assembly

Installation

2. Attach the Pinch Arm Assembly

(1) Pass a new pinch arm assembly through the shaft while hooking the spring as shown in the figure.

Notes

- Insert the short-end spring into the groove of the threading ring and hook the long-end spring to the side surface (drum side) of the pinch arm assembly.
- If the poly-slider washer ① was removed at the step 1, pass the same poly-slider washer through the shaft again.

(2) Fasten the pinch arm assembly by new stop washer.

Stop washer (2.3) : 3-669-596-00

(3) Push the pinch arm assembly manually in the direction of the drum, then release. At that time, confirm that the pinch arm assembly smoothly returns to the former position.

3. Adjust the Pinch Arm Assembly Vertical Play

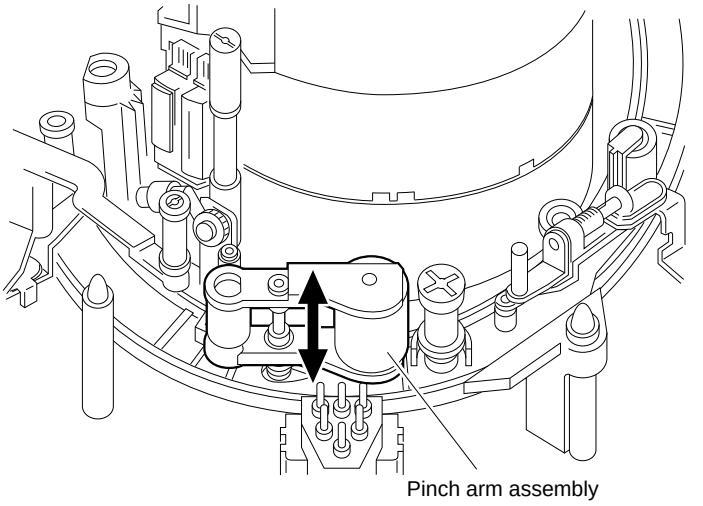
Move the pinch arm assembly in the vertical direction.
At this time, confirm that the vertical play satisfies the specification.

If the specification is not satisfied, perform the adjustment below.

(1) Remove the stop washer.
(2) Install or remove the poly-slider washer at the upper of the pinch arm.
(3) Fasten the pinch arm assembly by new stop washer, confirm again that the specification is satisfied.

4. Cleaning

Clean the pinch roller's cylindrical surface with a cleaning cloth moistened with cleaning fluid. (Refer to Section 5-2-6 in Maintenance Manual Part 1.)



Spec. : Vertical play
0.05 mm to 0.2 mm

* When the specification is not satisfied.

・Poly-slider washer for adjustment

Diameter	Thickness	Part No.
3.0 mm	0.13 mm	3-701-439-01
	0.25 mm	3-701-439-11

Adjust the Pinch Arm Assembly Vertical Play

Adjustment after Replacement

5. Confirm the Tape Running

Refer to Section 7-1-2.

6. Confirm the AT Head Height

Refer to Section 7-1-6.

7. Confirm the AT Head Azimuth

Refer to Section 7-1-7.

5-8. CTL Head Replacement

Replace the CTL head every 4,000 hours of tape running. (For previous CTL head)
When replacing, be sure to use the countermeasured CTL head.
This countermeasured head is not necessary to perform the periodical replacement.
For more detail, refer to Section 5-1-2 in Maintenance Manual Part 1.

Outline

Replacement

1. Disconnect the Harnesses
2. Remove the CTL/FE Head Assembly
3. Remove the CTL Head
4. Mount the CTL Head
5. Attach the CTL/FE Head Assembly
6. Connect the Harnesses
7. Cleaning (CTL and Full-frase Head Surface)

Adjustment after Replacement

8. Confirm the Tape Running (Refer to Section 7-1-2.)
9. Adjust the CTL Head Height (Refer to Section 7-1-4.)
10. Adjust the CTL Head Position (Refer to Section 7-1-5.)
11. Confirm the Tape Running (Refer to Section 7-1-2.)
12. Confirm the Audio/TC Position (Refer to Section 7-1-9.)
13. Adjust Drum Phase (Refer to Section 6-2-1.)

Preparation

1. Turn the power off.
2. Remove the upper lid. (Refer to Section 2-3-1 in Maintenance Manual Part 1.)
3. Remove the plate MD assembly.
   (Refer to Section 2-4 in Maintenance Manual Part 1.)
4. Remove the cassette compartment.
   (Refer to Section 2-5 in Maintenance Manual Part 1.)

Tools

- Cleaning cloth: 3-184-527-01
- Cleaning fluid: 9-919-573-01
- Torque screwdriver (6 kgf•cm) (JB-5251): J-6252-510-A
- Torque screwdriver's bit (+2 mm, l = 75 mm): J-6323-420-A

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Removal

1. Disconnect the Harnesses

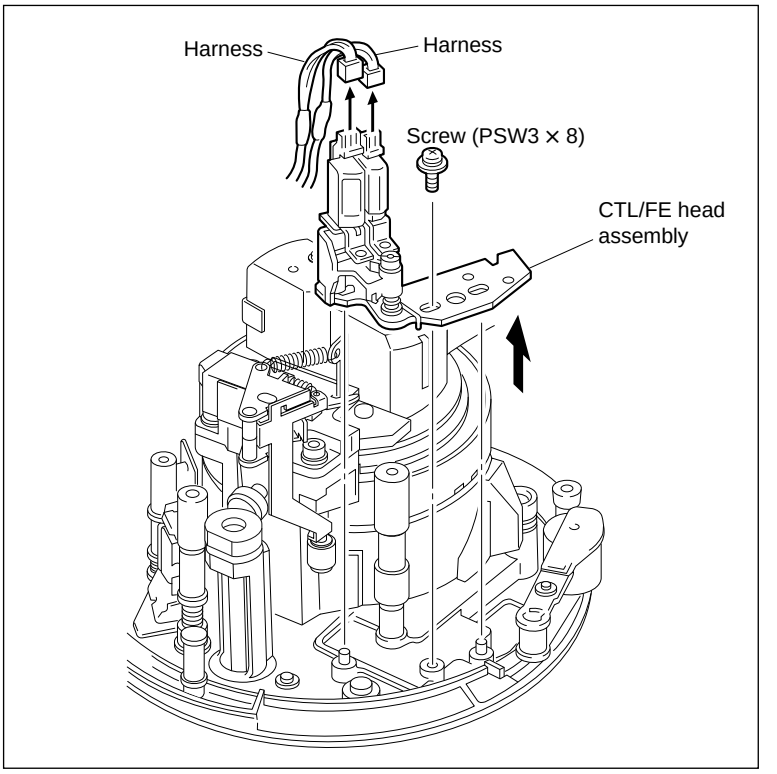
Disconnect the two harnesses from the connectors of the CTL/FE head assembly.

2. Remove the CTL/FE Head Assembly

Remove the screw, then remove the CTL/FE head assembly.

Note

Be careful not to touch the drum (especially video heads). Also, take care not to damage the peripheral tape guides.



Remove the CTL/FE Head Assembly

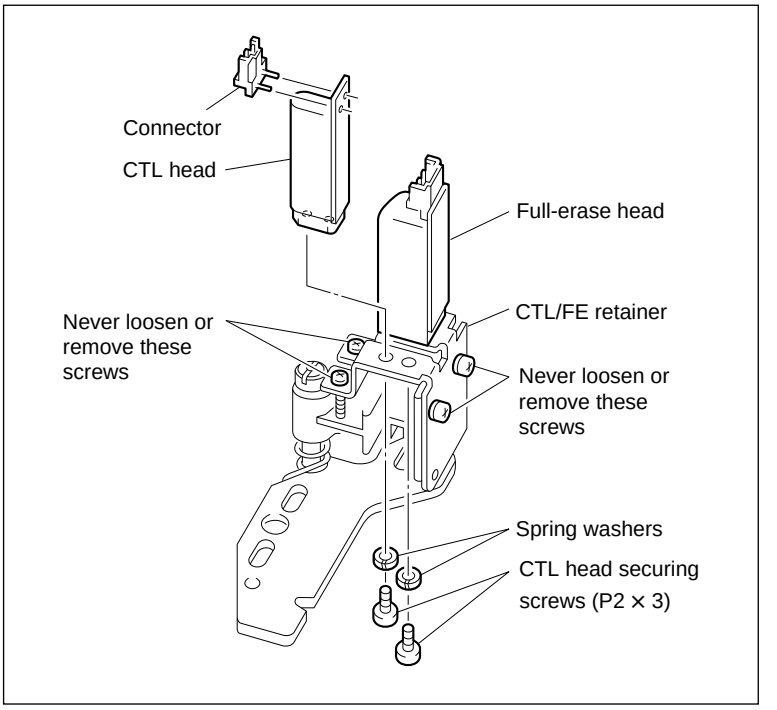
3. Remove the CTL Head

(1) Remove the two CTL head securing screws, then remove the CTL head.

Notes

- When removing the CTL head, be careful not to damage the full-erase head.
- Never loosen or remove the screws except for the CTL head securing screws. If these screws are loosened or removed, the zenith of the CTL and the full-erase head will be out of specification.

(2) Unsolder the connector pins.



Remove the CTL Head

Installation

4. Mount the CTL Head

(1) Solder the connector pin to the CTL head board.

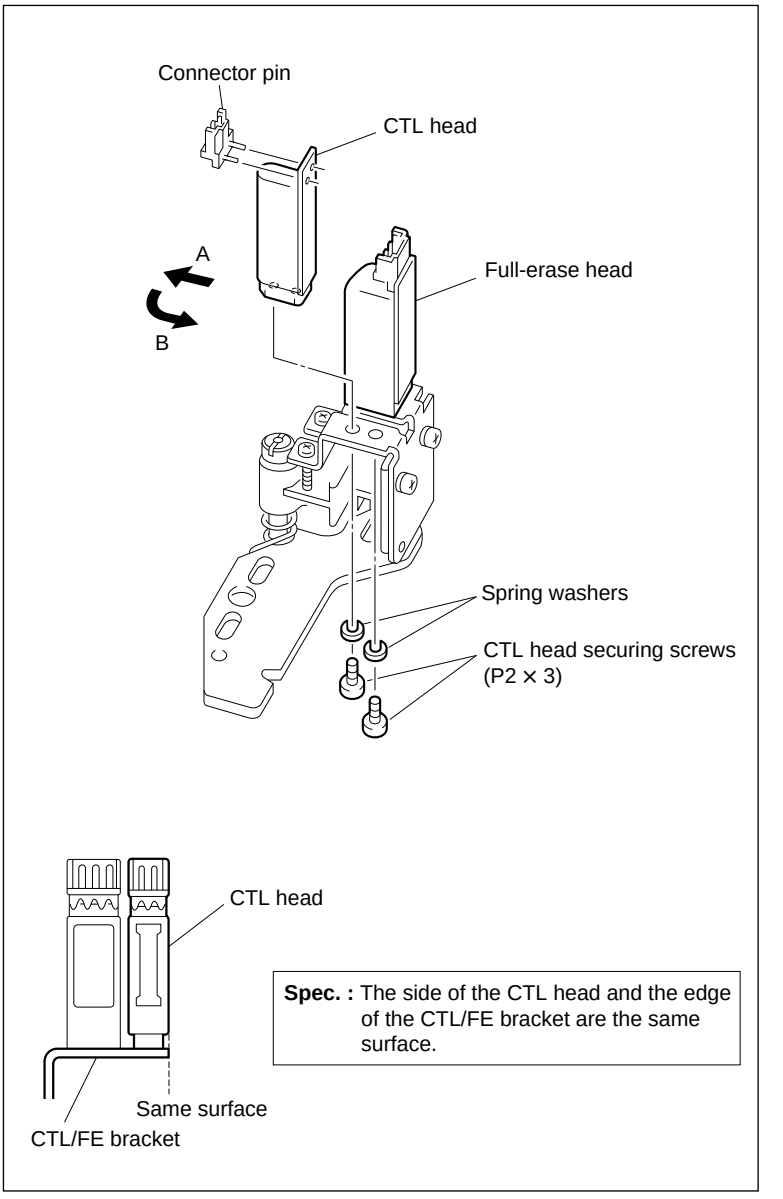
(2) Temporarily tighten the two screws while moving the CTL head in the direction indicated by arrows A and B.

Note

Be careful not to damage the CTL and full erase head.

(3) Confirm that the specification is met, securely tighten the two screws.

Tightening torque: 19.6×10^{-2} N • m
{2.0 kgf • cm}



Mount the CTL Head

5. Attach the CTL/FE Head Assembly

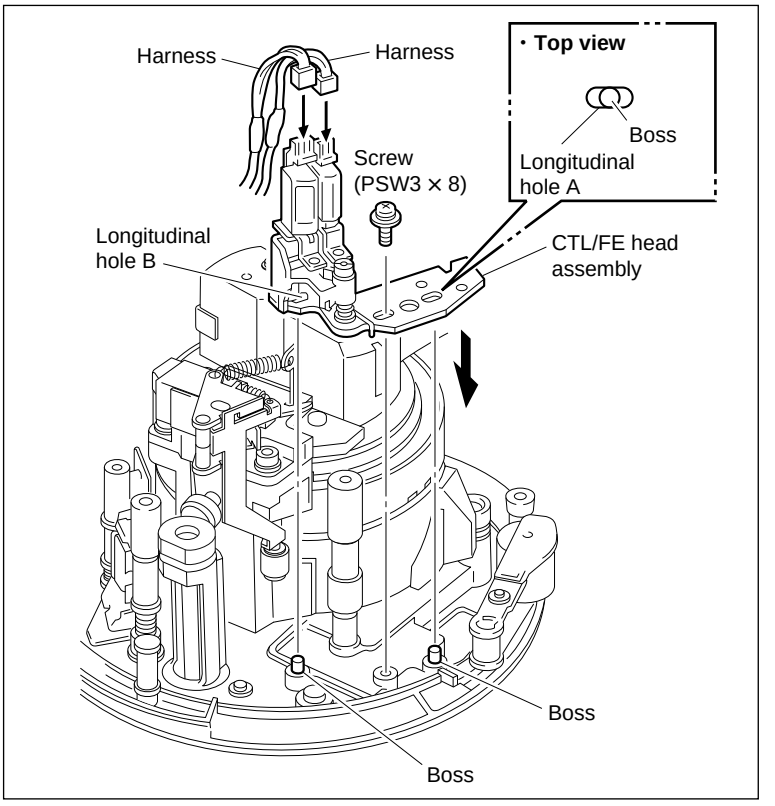
(1) Confirm that the threading ring is in the unthreading end state.

(2) Align the longitudinal holes A and B of the CTL/FE head assembly with the bosses of the chassis.

Note

Be careful not to touch the drum (especially video heads). Also, take care not to damage the peripheral tape guides.

(3) Align the boss of the chassis with center of the longitudinal hole A and tighten the screw.



Attach the CTL/FE Head Assembly

6. Connect the Harnesses

Connect the two harnesses to the connectors of the CTL/FE head assembly.

7. Cleaning

Clean the tape running surfaces of the CTL head and the full-erase head with a cleaning cloth moistened with cleaning fluid.
(Refer to Section 5-2-5 in Maintenance Manual Part 1.)

Adjustment after Replacement

8. Confirm the Tape Running

Refer to Section 7-1-2.

9. Adjust the CTL Head Height

Refer to Section 7-1-4.

10. Adjust the CTL Head Position

Refer to Section 7-1-5.

11. Confirm the Tape Running

Refer to Section 7-1-2.

12. Confirm the Audio/TC Head Position

Refer to Section 7-1-9.

13. Adjust the Drum Phase

Refer to Section 6-2-1.

5-9. Reel Motor Assembly Replacement

Replace the reel motor assembly every 4,000 hours of tape running.

5-9-1. Replacement Procedure of the Reel Motor Assembly

Outline

Replacement

1. Remove the Reel Table Assembly
2. Remove the Crank Arm and Slide Shaft Holder
3. Remove the RS Table Block Assembly
4. Disconnect the Harnesses
   (S side: CN926 and 927/RM Board, T side: CN926 and 927/RM Board)
5. Remove the Reel Motor Assembly
6. Cleaning
7. Attach the Reel Motor Assembly
8. Connect the Harnesses
   (S side: CN926 and 927/RM Board, T side: CN926 and 927/RM Board)
9. Connect the Flat Cable
   (S side: CN923/RM Board, T side: CN923/RM Board)
10. Insert the Slide Shaft
11. Attach the RS Table Block Assembly
12. Apply the Grease to the Slide Shaft
13. Attach the Crank Arm

Adjustment after Replacement

14. Confirm the Reel Motor Shaft Slantness (Refer to Section 5-9-2.)
15. Attach the Reel Table Assembly
16. Confirm the Cassette Pillar Height (Refer to Section 5-9-3.)
17. Confirm the Reel Table Height (Refer to Section 5-9-4.)
18. Confirm the Reel Brake Clearance (Refer to Section 5-9-5.)
19. Confirm the Reel Brake Release Amount (Refer to Section 5-9-6.)
20. Perform the Rell Table Rotation Sensor Adjustment (Refer to Section 5-9-7.)
21. Perform the Reel Motor Operation Check
    (Refer to Section 4-2-2 in Maintenance Manual Part 1.)
    (C010: S REEL MOTOR, C011: T REEL MOTOR)
22. Perform the Reel FG Duty Adjust
    (Refer to Section 4-2-7 in Maintenance Manual Part 1.)
    (A001: S REEL FG DUTY, A002: T REEL FG DUTY)
23. Perform the Reel Motor Offset/Friction Adjust
    (Refer to Section 4-2-7 in Maintenance Manual Part 1.)
    (A004: S REEL OFFSET/FRIC, A005: T REEL OFFSET/FRIC)
24. Perform the Reel Torque Adjust
    (Refer to Section 4-2-7 in Maintenance Manual Part 1.)
    (A006: S REEL TORQUE, A007: T REEL TORQUE)
25. Perform the Adjustmented Data Save
    (Refer to Section 4-2-7 in Maintenance Manual Part 1.)
    (A012: NV-RAM CONTROL)

Note

The parts consisting reel motor is different between S side and T side. However, how to replace the reel motor assembly is the same for both sides.

Preparation

1. Turn the power off.
2. Remove the upper lid. (Refer to Section 2-3-1 in Maintenance Manual Part 1.)
3. Remove the plate MD. (Refer to Section 2-4 in Maintenance Manual Part 1.)
4. Remove the cassette compartment. (Refer to Section 2-5 in Maintenance Manual Part 1.)

Tools

- L-shaped wrench (1.5 mm): 7-700-736-05
- Torque screwdriver (12 kg•cm) (JB-5252): J-6252-520-A
- Torque screwdriver's bit (+ 3 mm, l = 90 mm): J-6323-430-A
- Grease (SGL-601): 7-651-000-10
- Oil: 7-661-018-18
- Cleaning cloth: 3-184-527-01
- Cleaning fluid: 9-919-573-01

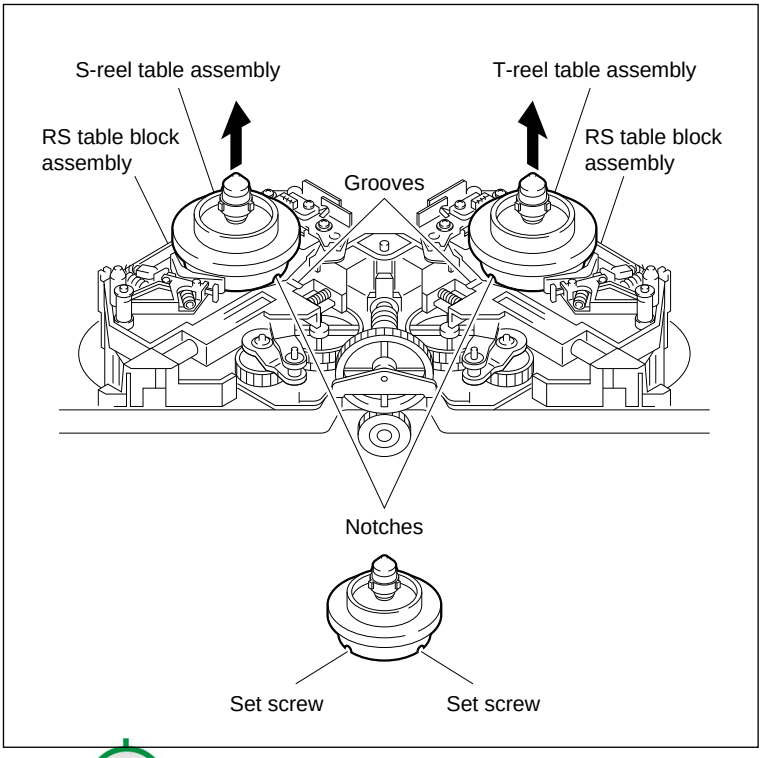
Removal

1. Remove the Reel Table Assembly

(1) Align one of the two notches at the bottom of the reel table assembly with the groove of the RS table block assembly.
(2) Insert the L-shaped wrench into the notch of the reel table assembly along the groove of the RS table block assembly.
(3) Loosen the set screw.
(4) Align another notch of the reel table assembly with the groove of the RS table block assembly.
(5) Loosen the set screw in the same way as in step (2).
(6) Remove the reel table assembly.

Note

When the reel table assembly is removed, a poly-slider washer may adhere to it. In this case, remove it from the reel table assembly and return it to the reel motor shaft position.
This poly-slider washer is used for reel table height adjustment.



gM **Remove the Reel Table Assembly**

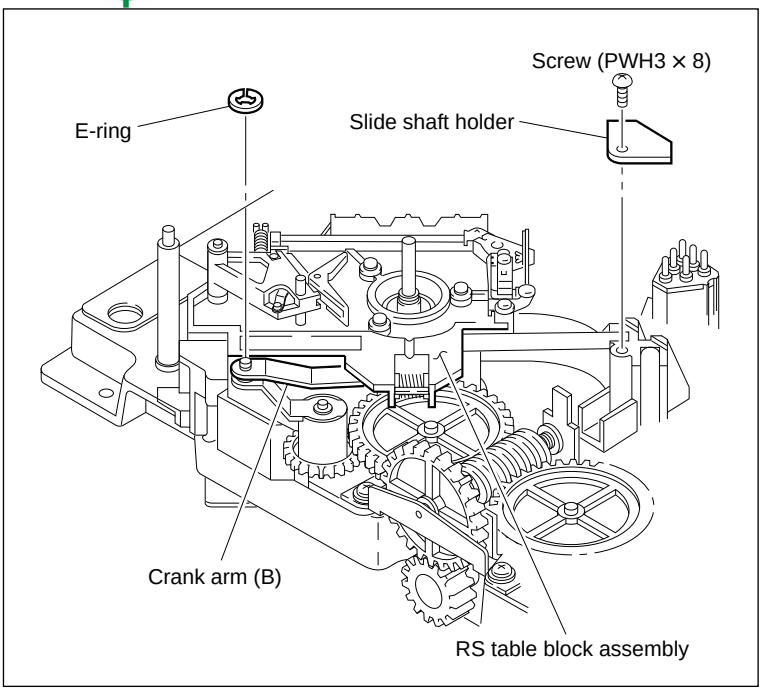
2. Remove the Crank Arm and Slide Shaft Holder

(1) Place the RS table block assembly in the intermediate position of S and L cassettes.

Note

The RS table block assembly cannot be removed in the S cassette position or T cassette position.

(2) Remove the E ring and remove the crank arm (B).
(3) Remove the screw and remove the slide shaft holder.



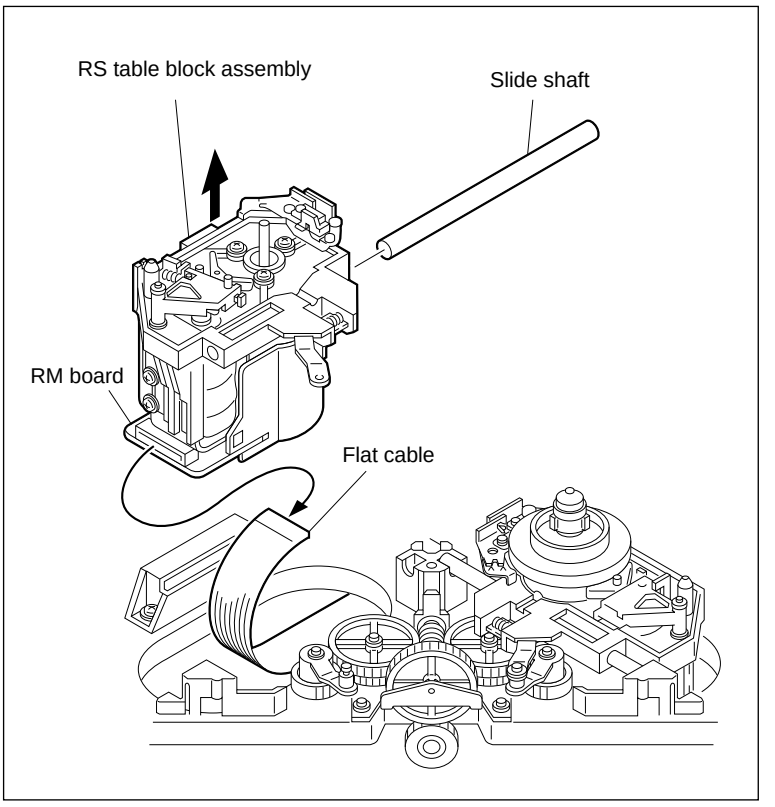
Remove the Crank Arm and Slide Shaft Holder

3. Remove the RS Table Block Assembly

(1) While pulling out the slide shaft, remove the RS table block assembly.
(2) Disconnect the flat cable from the connector on the RM board.
(3) Wipe the grease that is adhering to the holes (two) pulled out the slide shaft on the RS table block assembly using a cloth.
(4) Wipe the grease that is adhering on the surface of the slide shaft using a cloth.

Notes

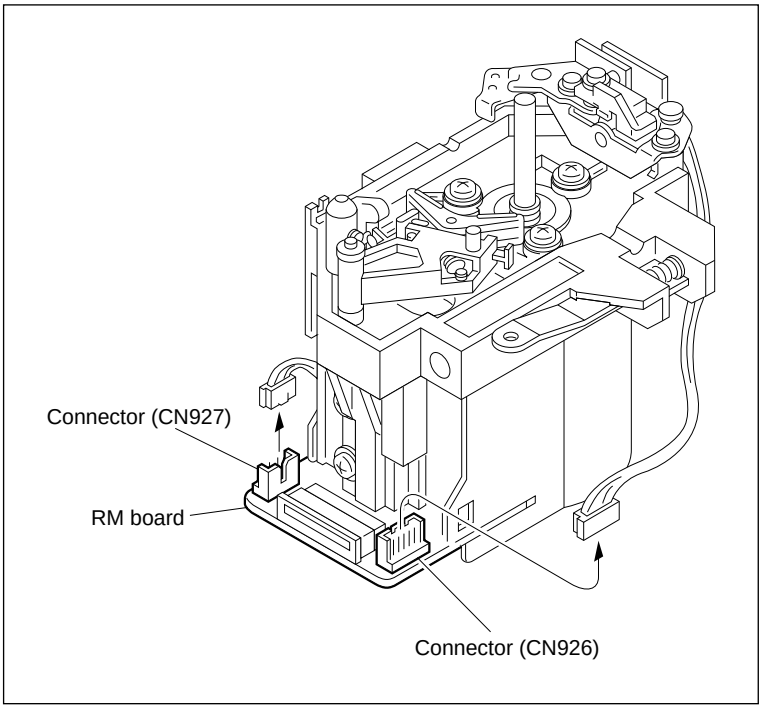
- Be careful not to adhere grease smeared the slide shaft to another parts.
- Be careful not to cause damage to the slide shaft during removal.



Remove the RS Table Block Assembly

4. Disconnect the Harnesses

Disconnect the harnesses from the two connectors CN926 and CN927 on the RM board.



Disconnect the Harnesses

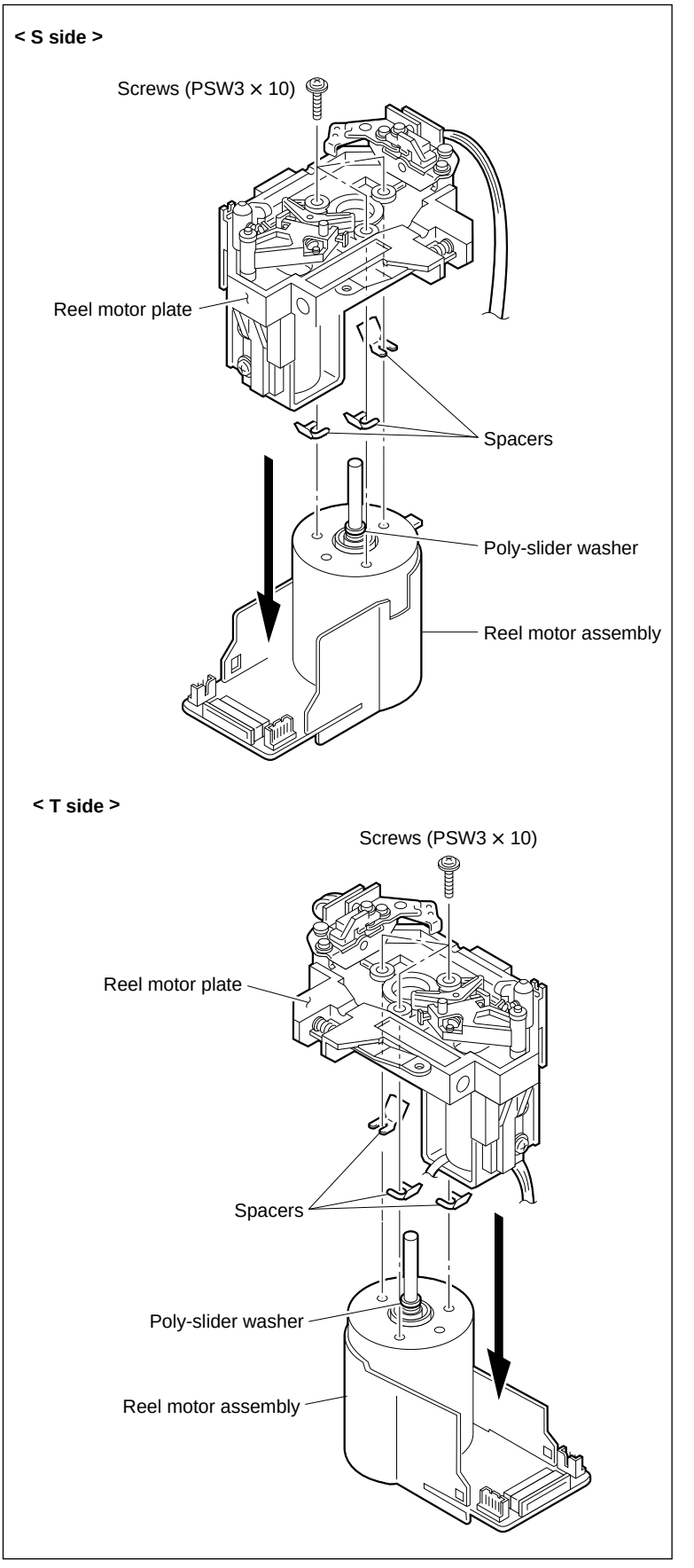
5. Remove the Reel Motor Assembly

(1) Remove the three screws and remove the reel motor assembly.

Note

The spacer(s) is inserted between the reel motor and the reel motor plate. Be careful not to lose spacer(s) since it comes off with the reel motor assembly.

(2) Remove the poly-slider washer from the reel motor shaft.
Be careful not to loose the removed poly-slider washer.



Remove the Reel Motor Assembly

Installation

6. Cleaning

Clean the mounting surfaces of the reel motor assembly and reel motor plate.

7. Attach the Reel Motor Assembly

(1) Pass the reel motor assembly through the hole of the reel motor plate as in the direction shown in the figure.

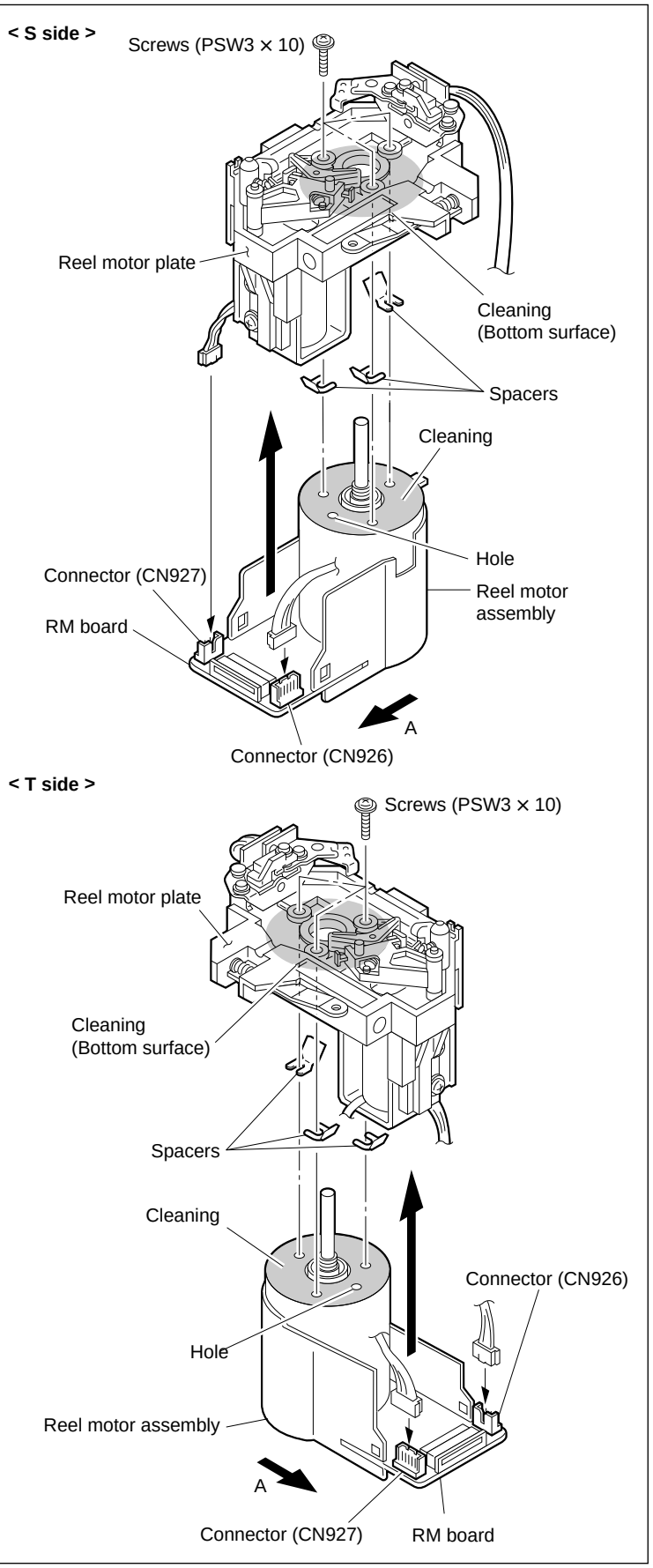
(2) Tighten the three screws gradually while moving the reel motor assembly in the direction indicated by the arrow A.

Tightening torque: 68.6×10^{-2} N • m
{7 kgf • cm}

(3) Pass the poly-slider washer removed in (2) of step 5 through the reel motor shaft.

8. Connect the Harnesses

Connect the harnesses to the two connectors CN926 and CN927 on the RM board.



Attach the Reel Motor Assembly

9. Connect the Flat Cable

(1) Clean the inserting portion of the flat cable using a dry cleaning cloth.
(2) Connect the flat cable disconnected in step 3 to the connector on the RM board, then lock.

Notes

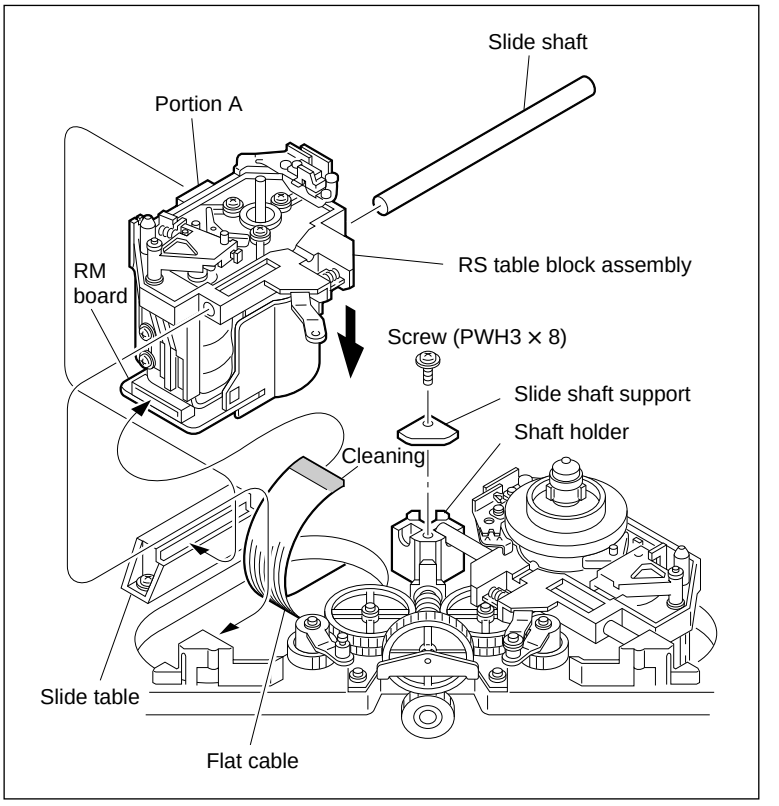
- Connect the flat cable with its conductor plating part (printing surface) up.
- Be careful not to bend the flat cable when connecting it.

10. Insert the Slide Shaft

Pass the slide shaft through the hole of the RS table block assembly.

11. Attach the RS Table Block Assembly

(1) Put the slide shaft on the shaft holder while inserting the portion A shown in the figure of the RS table block assembly into the slide table.
(2) Attach the slide shaft support with the screw.



Attach the Slide Shaft

12. Apply the Grease to the Slide Shaft

(1) Slightly apply grease to the slide shaft and it to the whole slide shaft.

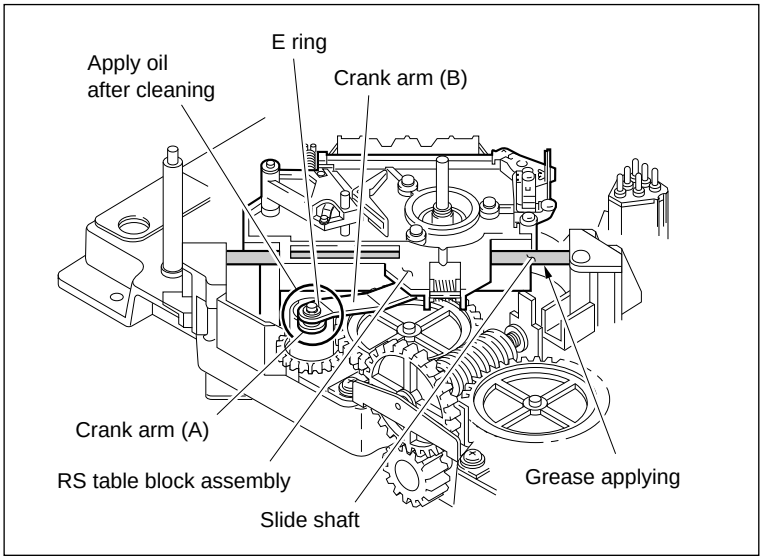
Note

Be careful that the grease does not adhere to other parts.

(2) Confirm that the RS table block assembly smoothly moves when it is shifted to S cassette and L cassette positions.

13. Attach the Crank Arm

(1) Clean the shaft of the crank arm (A), then apply one a drop of oil on it.
(2) Confirm that the RS table block assembly is in the middle between S and L cassette positions.
(3) Attach apply one the crank arm (B) to the shaft of the crank arm (A) with the E ring.



Attach the Crank Arm

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Adjustment after Replacement

14. Confirm the Reel Motor Shaft Slantness

Refer to Section 5-9-2.

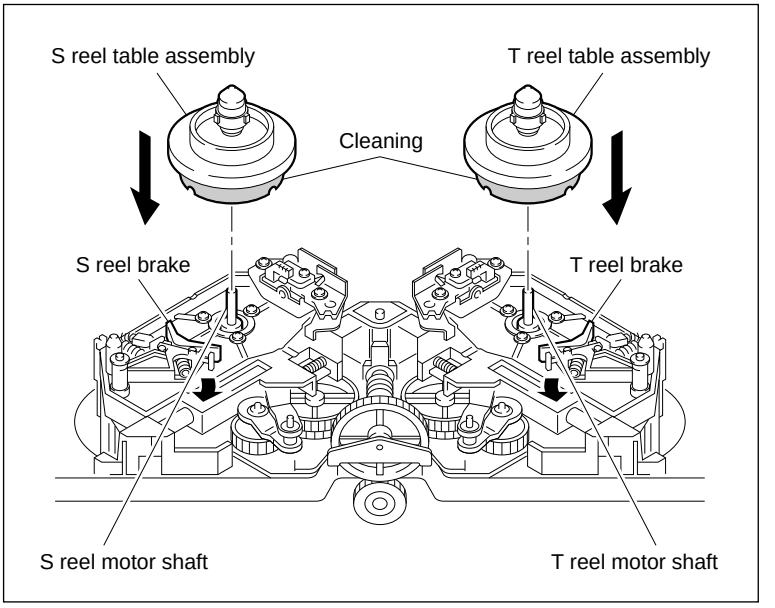
15. Attach the Reel Table Assembly

(1) Clean the circumference of the reel table assembly.

(2) Pass the reel table assembly through the reel motor shaft while moving the reel brake in the direction indicated by the arrow.

Note

Tighten the two set screws of the reel table after the reel table height confirmation is complated.



Attach the Reel Table Assembly

16. Confirm the Cassette Pillar Height

Refer to Section 5-9-3.

17. Confirm the Reel Table Height

Refer to Section 5-9-4.

18. Confirm the Reel Brake Clearance

Refer to Section 5-9-5.

19. Confirm the Reel Brake Release Amount

Refer to Section 5-9-6.

20. Reform the Reel Table Rotation Sensor Portion Adjustment

Refer to Section 5-9-7.

21. Perform the Reel Motor Operation Check

Refer to Section 4-2-2 in Maintenance Manual Part 1.
(C010: S REEL MOTOR,
C011: T REEL MOTOR)

22. Perform the Reel FG Duty Adjust

Refer to Section 4-2-7 in Maintenance Manual Part 1.
(A001: S REEL FG DUTY,
A002: T REEL FG DUTY)

23. Perform the Reel Offset/Friction Adjust

Refer to Section 4-2-7 in Maintenance Manual Part 1.
(A004: S REEL OFFSET/FRIC,
A005: T REEL OFFSET/FRIC)

24. Perform the Reel Torque Adjust

Refer to Section 4-2-7 in Maintenance Manual Part 1.
(A006: S REEL TORQUE,
A007: T REEL TORQUE)

25. Perform the Adjusted Data Save

Refer to Section 4-2-7 in Maintenance Manual Part 1.
(A012: NV-RAM CONTROL)

5-9-2. Reel Motor Shaft Slantness Adjustment

Notes

- Be sure to check the slantness of the reel motor shaft when the reel motor assembly is removed or when the RS table block assembly is removed.
- Perform the reel motor shaft slantness adjustment correctly.
  If this adjustment is not performed correctly, a reel hub touches the case in a cassette tape, a noise occurs, and the tape does not run correctly. This may damage the tape.

Tools

- Cassette reference plate (L) (MW-088): J-6320-880-A
- Reel motor shaft slantness check tool (MW-087): J-6320-870-A
- Thickness gauge: 9-911-053-00
- Torque screwdriver (12 kg•cm) (JB-5252): J-6252-520-A
- Torque screwdriver's bit (+3 mm, l=50 mm): J-6323-430-A

Check

1. Set the Cassette Reference Plate (L)

Place the cassette reference plate (L) in the direction shown in the figure, then place it on two cassette supports.

2. Place the Reel Shift Plate Assembly in the L Cassette Position

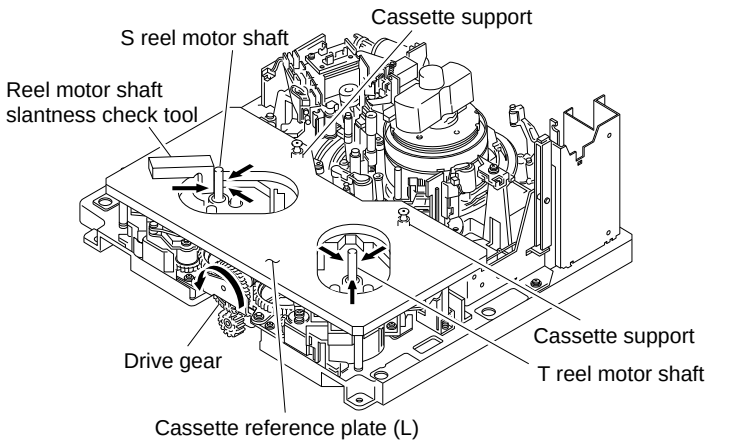
Rotate the drive gear counterclockwise as far as it will go.

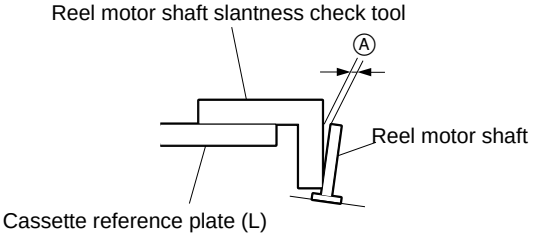
3. Check the Slantness in the L Cassette Position

(1) Press the check tool against the reel motor shaft from the directions indicated by the arrow.
(2) Check that the clearance between the reel motor shaft and tool satisfies specification 1.

If the specification is not satisfied, perform steps 6 through 10.

< L cassette position >





Spec.1: (L cassette position)
A ≦ 0.03 mm

Check the Reel Motor Shaft Slantness (L)

4. Place the Reel Shift Plate Assembly in the S Cassette Position

Rotate the drive gear clockwise as far as it will go.

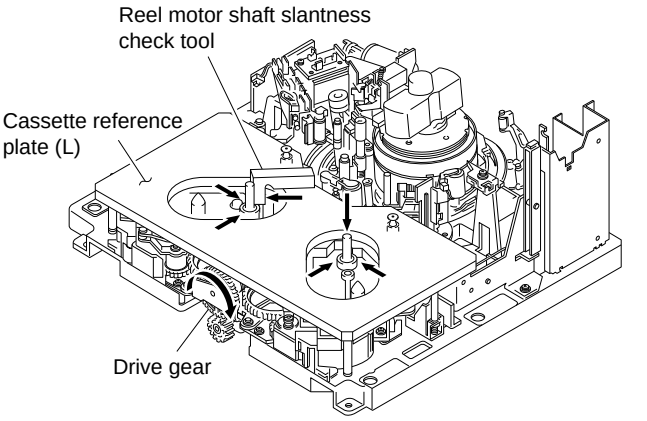
5. Check the Slantness in the S Cassette Position

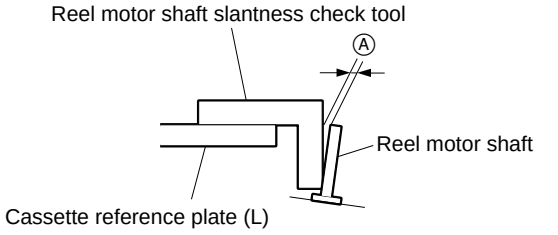
(1) Press the check tool against the reel motor shaft from the directions indicated by the arrow.

(2) Check that the clearance between the reel motor shaft and tool satisfies specification 2.

If the specification is not satisfied, perform steps 6 and later.

< S cassette position >





Spec.2 : (S cassette position)
A ≦ 0.1 mm

Check the Reel Motor Shaft Slantness (S)

Adjustment

6. Loosen Screws

Loosen the three screws fixing the reel motor by one to two turns.

7. Bend Spacer

Bend the adjustment spacer as shown in the figure.

8. Insert Spacer

Insert the adjustment spacer into the square hole on the upper surface of the reel motor plate with tweezers.

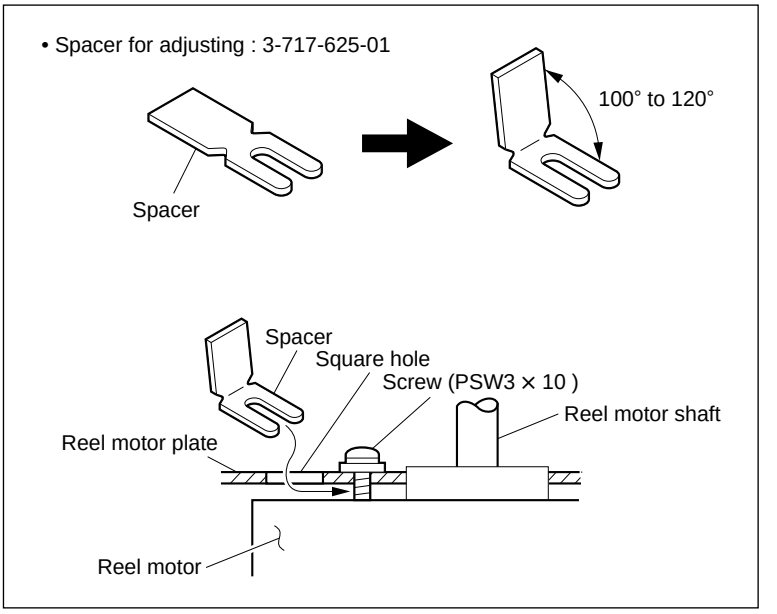
9. Tighten Screws

Gradually tighten the three screws loosened in step 6.

Tightening torque: 68.6×10^{-2} N • m
{7 kgf • cm}

10. Recheck the Reel Motor Shaft Slantness

Refer to steps 2 through 5.



Ajustment the Reel Motor Shaft Slantness

5-9-3. Cassette Pillar Height Adjustment

Note

- Be sure to check the height of the cassette pillars when the reel shift plate assembly is removed.

Tools

- Cassette reference plate (L) (MW-088): J-6320-880-A
- Small dental mirror (circular): J-6080-029-A
- L-shaped wrench (1.5 mm): 7-700-736-05

Check

1. Set the Cassette Reference Plate (L)

Place the cassette reference plate (L) in the direction shown in the figure, then place it on two cassette pillars.

2. Place the Reel Shift Plate Assembly in the Intermediate Position of S and L Cassettes

(1) Rotate the drive gear and place the reel shift plate assembly in the intermediate position of S and L cassettes.

Note

The reel shift plate assembly should be moved to the position where the cassette pillars do not appear from the hole of the cassette reference plate (L).

(2) Check that the S and T cassette pillars are positioned under the cassette reference plate (L).

3. Check the Cassette Pillar Height

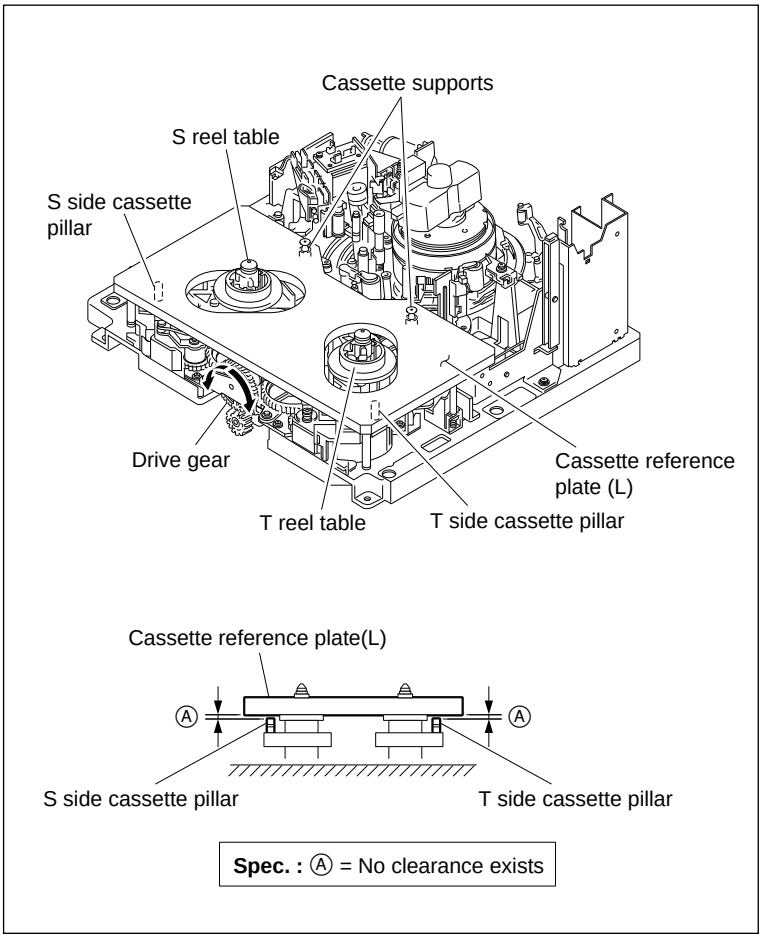
(1) Turn the casstte reference plate (L) over and place it on the cassette pillars.

Note

The reference plate should be turned over because it has a concave portion at the back of the cassette reference plate (L) and cannot be adjusted correctly.

(2) Check with a small dental mirror that there are no clearances between the S and T cassette pillars and the reference plate (L).

If the specification is not satisfied, perform steps 4 through 6.



Check the Cassette Pillar Height

Adjustment

4. Loosen Securing Screw

Loosen the set screw of the S or T cassette pillar by one to two turns.

5. Adjust the Cassette Pillar Height

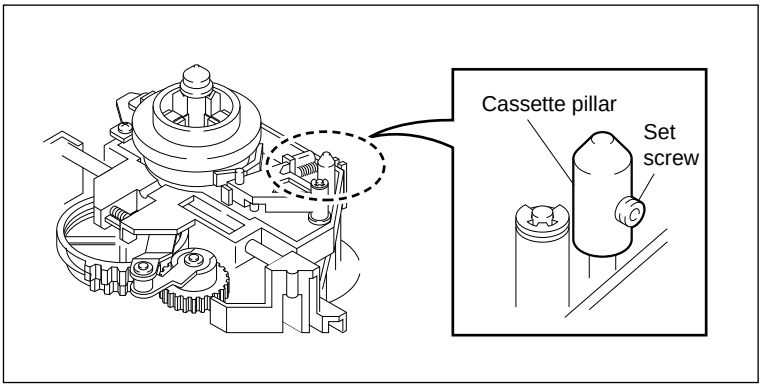
Lift the cassette pillar and press it slightly against the lower surface of the cassette reference plate (L).
Tighten the set screw under this condition.

6. Recheck the Cassette Pillar Height

Check that the height of the S and T cassette pillars satisfy the specification.

Note

Shift the tightening position of the fixing screw when performing readjustment with the specification not satisfied. (Do not tighten the screw in the same position as previous.)



Adjust the Cassette Pillar Height

5-9-4. Reel Table Height Adjustment

Notes

- Be sure to check the height of the reel table when a reel table is removed or when it is replaced.
- Perform the reel table height adjustment correctly.
  The height of the reel table is used as the reference for the tape path.
- After the supply reel table height adjustment is performed, be sure to check the video tracking. (Refer to Section 7-1-3.)

Tools

- Cassette reference plate (L) (MW-088): J-6320-880-A
- Reel table height gauge (MW-935): J-6329-350-A
- L-shaped wrench (1.5 mm): 7-700-736-05

Check

1. Set the Cassette Reference Plate (L)

Place the cassette reference plate (L) in the direction shown in the figure, then place it on two cassette supports.

2. Place the Reel Shift Plate Assembly in the L Cassette Position

Rotate the drive gear counterclockwise as far as it will go.

3. Check the Take-up Reel Table Height

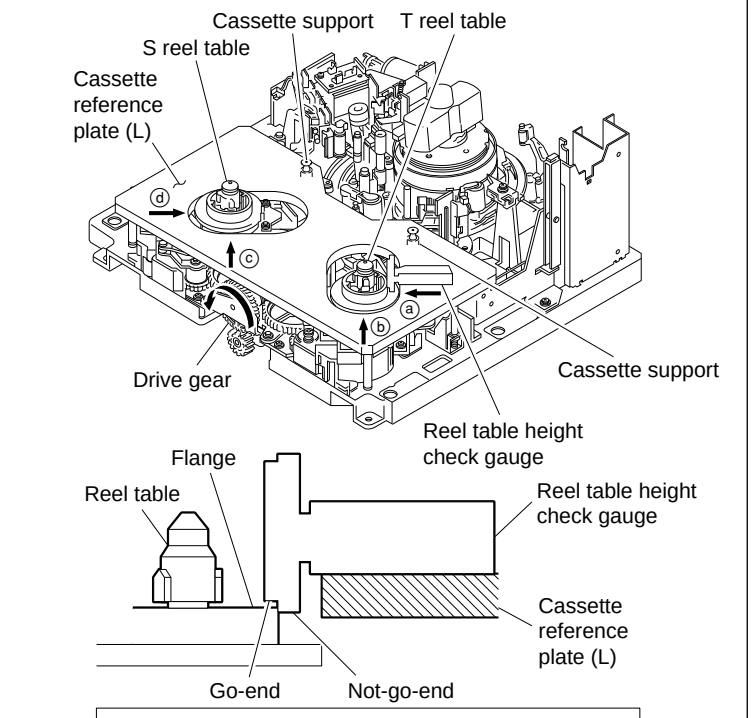
(1) Press the "T"-stamped side of the gauge against the take-up reel table from the direction indicated by the arrow ⓐ.
(2) Check that the specification is satisfied while rotating the take-up reel table clockwise by one turn.
(3) Check the reel table height from the directions indicated by the arrow ⓑ in the same way.

4. Check the Supply Reel Table Height

(1) Press the "S"-stamped side of the gauge against the supply reel table from the direction indicated by the arrow ⓒ.
(2) Check that the specification is satisfied while rotating the supply reel table counter-clockwise by one turn.
(3) Check the reel table height from the directions indicated by the arrow ⓓ in the same way.

If the specification is not satisfied in steps 3 and 4, perform steps 7 and 8.

< L cassette position >



Spec. : The go-end of the gauge slide over the flange of the reel table.
The not-go-end of the gauge does not slide over.

Check the Reel Table Height (L)

5. Place the Reel Shift Plate Assembly in the S Cassette Position

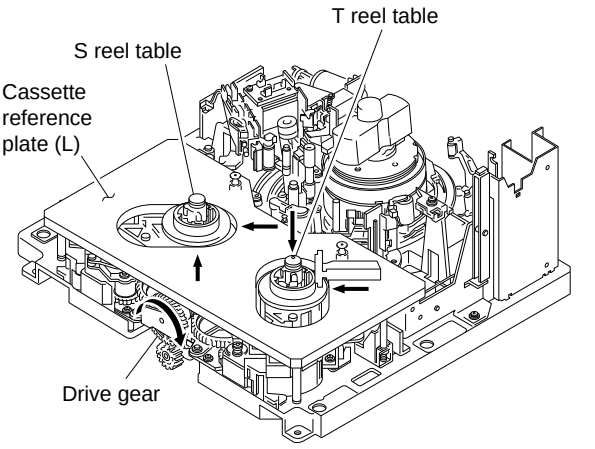
Rotate the drive gear clockwise as far as it will go.

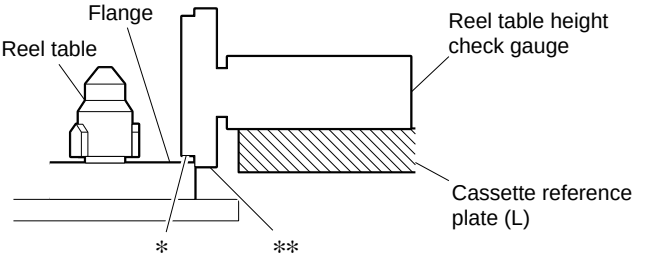
6. Check the Supply and Take-up Reel Table Height

Perform in the same way as in steps 3 and 4.

If the specification is not satisfied, perform steps 7 and later.
If the specifications are satisfied in both the L and S cassette positions, perform steps 9 and later.

< S cassette position >





Spec.: The * marked portion of the gauge slide over the flange of the reel table.
The ** marked portion of the gauge does not slide over.

Adjustment

7. Remove the Reel Table

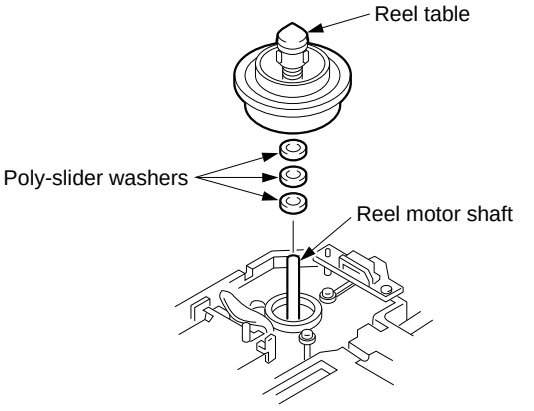
Refer to step 1 in Section 5-9-1.

8. Adjust the Number of Poly-slider Washers

Adjust the number of poly-slider washers installed in the reel motor shaft so that the specifications are satisfied in both the L and S cassette positions.

9. Remove the Cassette Reference Plate (L)

Remove the cassette reference plate (L) and reel table height gauge.



・Poly-slider washer for adjustment

Diameter	Thickness	Part No.
4 mm	0.05 mm	3-188-108-01
	0.13 mm	3-701-441-01
	0.25 mm	3-701-441-11
	0.5 mm	3-701-441-21

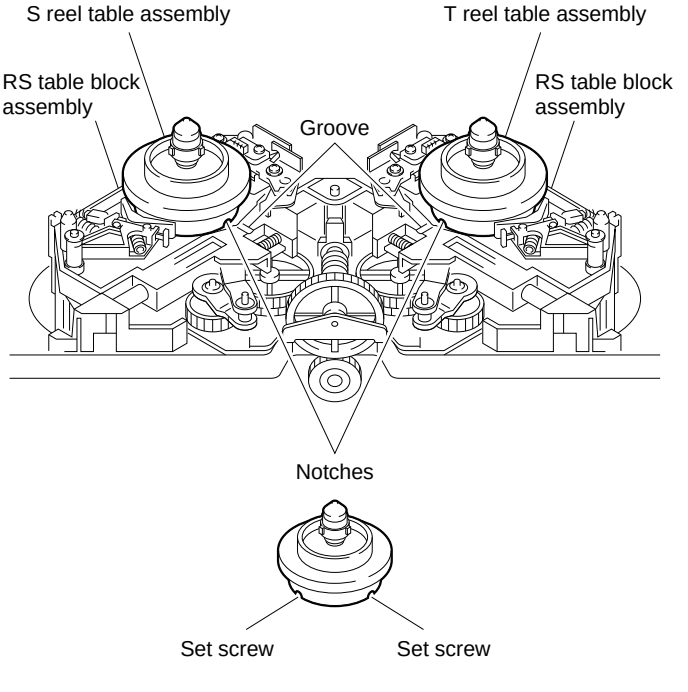
Remove the Reel Table

10. Tighten the Screws of the Reel Table Assembly

(1) Align the notch at the bottom of the reel table assembly with the groove position of the RS table block assembly.
(2) Insert an L-shaped wrench into the notch at the bottom of the reel table assembly along the groove of the RS table block assembly and tighten the two set screws.

11. Recheck the Reel Table Height

Refer to steps 2 through 6.



Tighten the Screws of the Reel Table Assembly

5-9-5. Reel Brake Clearance Check

Note

- Be sure to check clearance of the reel brake when the reel table assembly is removed or when it is replaced.

Check

1. Check the Take-up Reel Brake Clearance

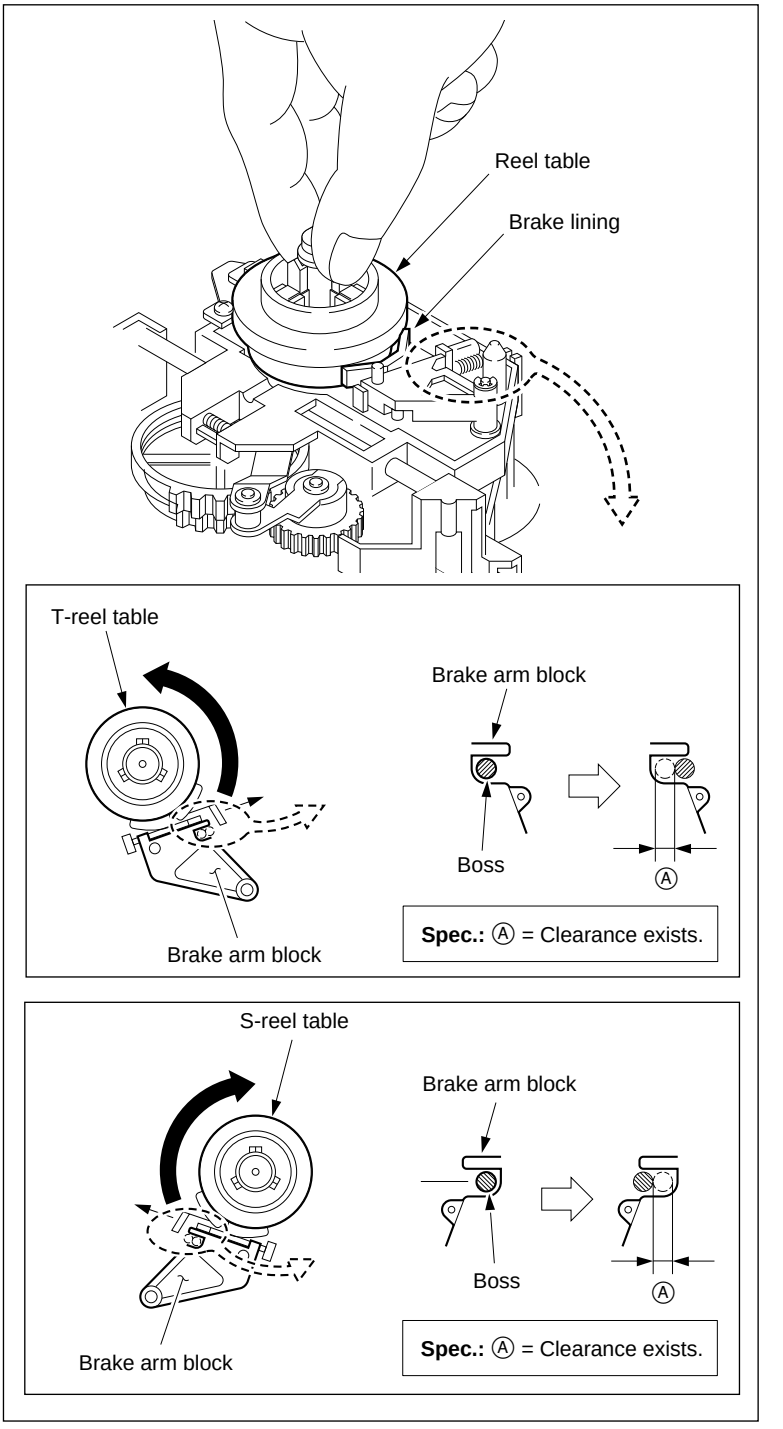
Rotate the take-up reel table counterclockwise by fingers.
At that time, check that a clearance occurs between the brake arm block and boss.

If no clearance occurs, replace the brake lining.
Brake Lining Replacement : Section 5-22.

2. Check the Supply Reel Brake Clearance

Rotate the supply reel table clockwise by fingers.
At that time, check that a clearance occurs between the brake arm block and boss.

If no clearance occurs, replace the brake lining.
Brake Lining Replacement : Section 5-22.



Check the Reel Brake Clearance

http://getMANUAL.com

5-9-6. Reel Brake Release Amount Adjustment

Notes

- Be sure to check the release amount of the reel brake when the reel table assembly is removed or when it is replaced.
- Be sure to check the following when performing adjustment with the specification not satisfied.
  (1) Cassette pillar height check (Refer to Section 5-9-3.)
  (2) Reel table height check (Refer to Section 5-9-4.)

Basic knowledge

The brake lining is pressed against the reel table when the power is off.
When the power is turned on, the brake lining is released and away from the reel table.
In the PLAY, STOP, REW, F. FWD, SEARCH and REV modes, the brake lining remains released.
Press the EJECT button to put the unit into the EJECT mode. The brake lining is pressed against the reel table a few seconds after the EJECT mode is completed.

Tool

- Wire clearance check gauge set: J-6152-450-A

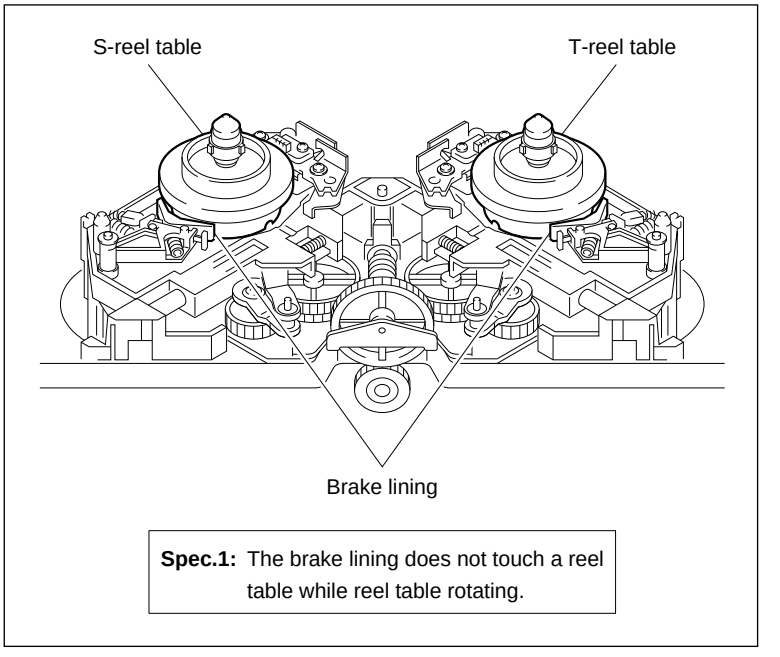
Check

1. Turn the Power On

2. Check the Brake Release Amount

Check on the supply and take-up sides that the brake lining does not touch the reel table while a reel table is rotating. (Specification 1)

If specification 1 is not satisfied, perform steps 3 and later.



Check the Reel Brake Release Amount

Adjustment

3. Turn the Power Off

4. Remove the RS Table Block Assembly
Refer to steps 1 through 3 in Section 5-9-1.
(It is not necessary to remove a reel table.)

5. Loosen the Screws
Loosen the two screws fixing the brake solenoid.

6. Adjust the Brake Solenoid Position
Press down the iron core of the brake solenoid to the energized position.
At that time, adjust the brake solenoid position so that the clearance between the brake lining and reel table satisfies specification 2.

Note

Press down only the iron core by a sharp-pointed stick. Do no touch other portions.

Know-how:
- Shift the brake solenoid upward.
  →Clearance A is narrowed.
- Shift the brake solenoid downward.
  →Clearance A is widened.

7. Tighten the Screws
Tighten the two screws loosened in step 5.

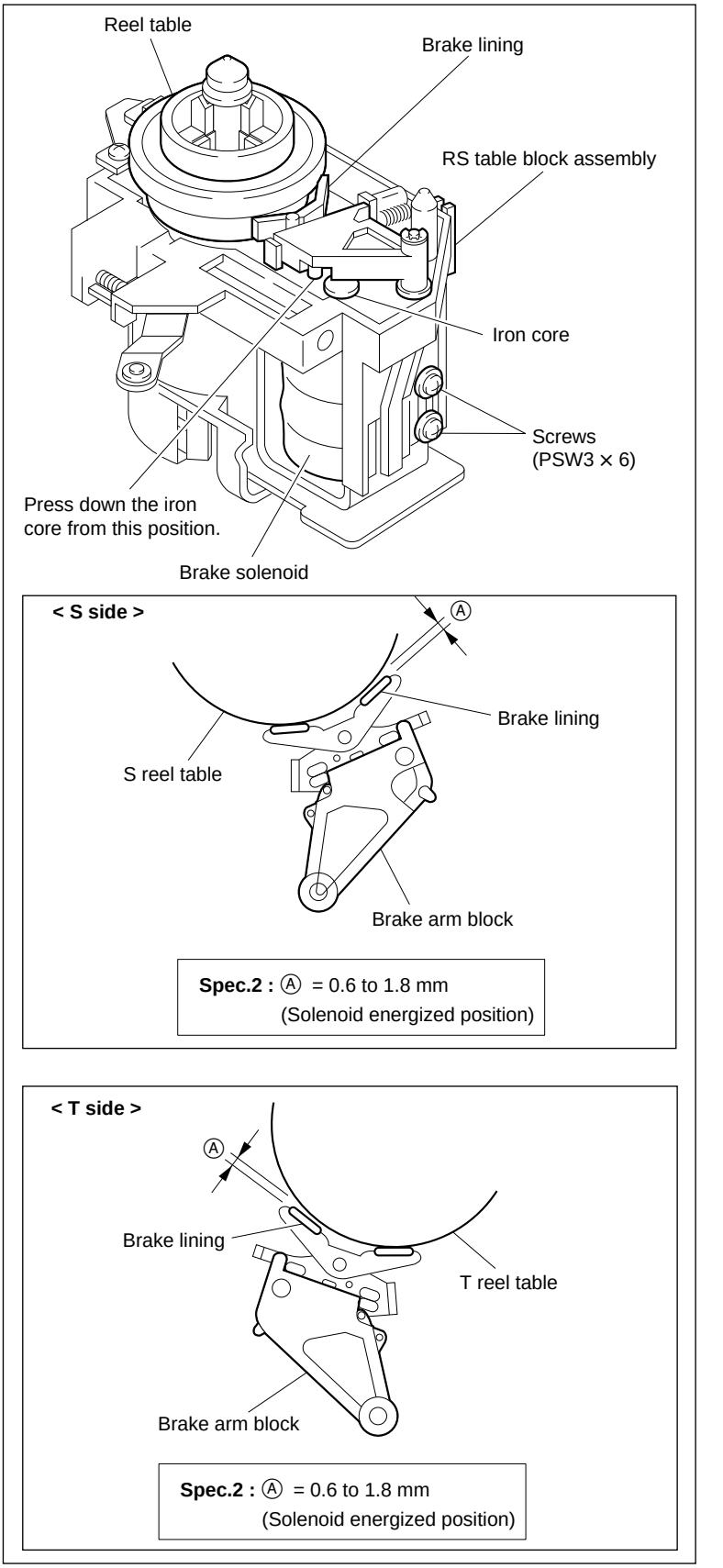
Tightening torque : 98×10^{-2} N • m
{10.0 kgf • cm}

8. Recheck the Brake Slolenoid Position
Refer to step 6.

9. Attach the RS Table Block Assembly
Refer to steps 9 through 13 in Section 5-9-1.
(It is not necessary to smear grease again to the slide shaft or to apply oil again to the crank arm (A).)

10. Check the Cassette Pillar Height
Refer to Section 5-9-3.

11. Check the Reel Table Height
Refer to Section 5-9-4.



Check the Reel Brake Release Amount

5-9-7. Reel Table Rotation Sensor Position Adjustment

Note

- Be sure to check the position of the reel table rotation sensor when a reel motor assembly or reel table is replaced.

Tools

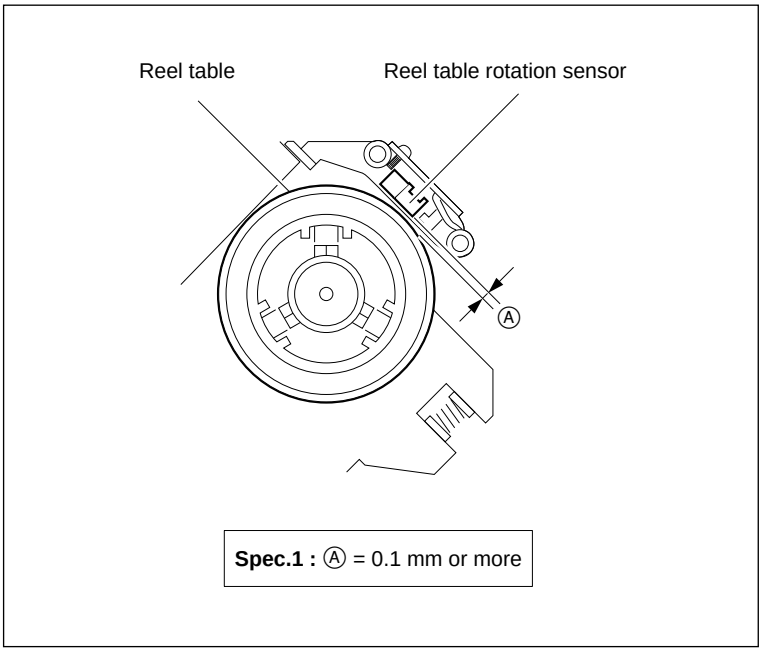
- Thickness gauge: 9-911-053-00
- Torque screwdriver (6 k•cm) (JB-5251): J-6252-510-A
- Betacam cassette tape

Check

1. Check the Reel Table Rotation Sensor Clearance

Check that the clearance between the reel table and the reel table rotation sensor satisfies the specification 1.

If the specification 1 is not satisfied, perform steps 4 and later.



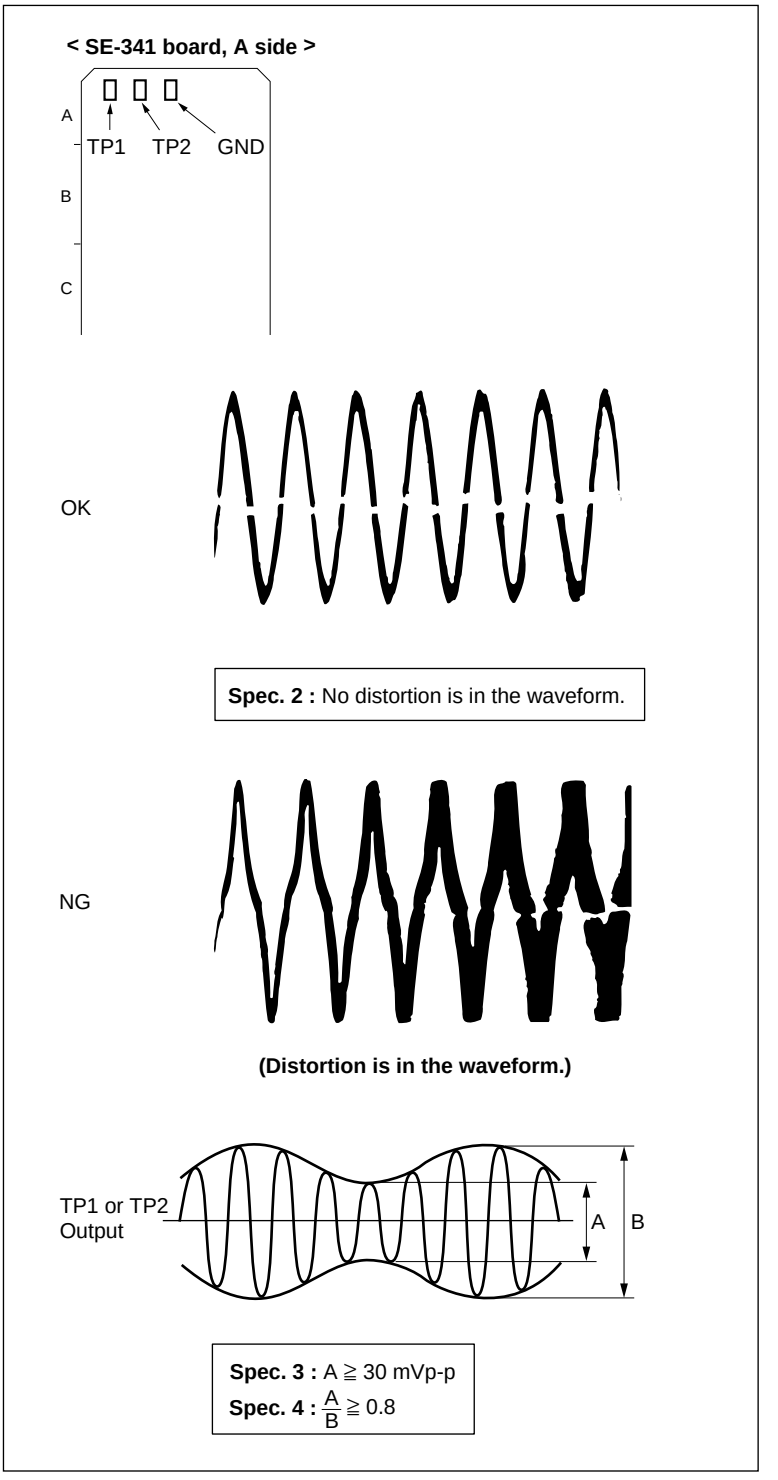
Check the Reel Table Rotation Sensor Clearance

2. Connect the Oscilloscope

CH-1: TP1/SE-341 board (S-FG signal)
CH-2: TP2/SE-341 board (T-FG signal)

3. Check the Reel FG Output Level

(1) Turn the power on.
(2) Put the EJECT mode by putting the EJECT button.
(3) Insert the cassette tape.
(4) Put the unit into the PLAY mode, then check the outputs of CH-1 and CH-2 satisfy the specification 2.
(5) Eject the cassette tape by putting the EJECT button.
(6) Put the unit into the STOP mode in a state of without the cassette tape in the unit by putting the STOP button.
(7) In the step (6), check that the outputs of CH-1 and CH-2 satify specifications 3 and 4.



Check the Reel FG Output Level

Adjustment

4. Loosen the Screw

Loosen the two screws by 1/4 to 1/2 turn.

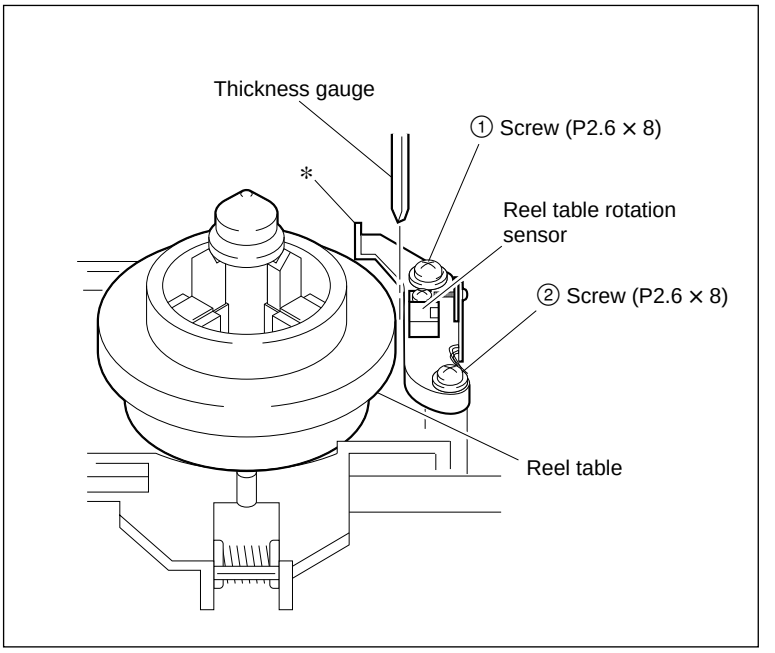
5. Adjust the Reel Table Rotation Sensor Position

(1) Put the unit into the STOP mode in a state of without cassette tape by putting the STOP button.

(2) Adjust the position of the reel table rotation sensor so that the distortion is not in the waveform, and maximize.
Adjustment method: Grasp the ∗ marked portion, and move it right and left about screw ②.

(3) Tighten the two screws loosen in step 4 in order of ① and ② while keeping the state of the step (2).

Tightening torque: 49×10^{-2} N • m
{5 kgf • cm}



Adjust the Reel Table Rotation Sensor Position

6. Recheck the Reel Table Rotation Sensor Position

(1) Insert the thickness gauge (t=0.1 mm) between the reel table rotation sensor and the reel table.

Note

Be careful not to damage the reel flange and the reel table rotation sensor.

(2) Rotate the reel table, and check that it rotates smoothly.

(3) Recheck that the specifications 1 through 4 are satisfied referring to steps 1 through 3.

5-10. Capstan Motor Replacement

Replace the capstan motor every 6,000 hours of tape running.

Outline

Replacement

1. Remove the Video Head Cleaner Assembly
2. Remove the Demagnetization Head Assembly
3. Remove the Capstan Motor
4. Attach the Capstan Motor
5. Attach the DR-315 Board
6. Attach the HDD Unit
7. Attach the Demagnetization Head Assembly
8. Attach the Video Head Cleaner Assembly
9. Cleaning (Capstan Motor Shaft)

Adjustment after Replacement

10. Confirm the Pinch Press Clearance (Refer to Section 5-12-2.)
11. Confirm the Tape Running (Refer to Section 7-1-2.)
12. Perform the Capstan Motor Operation Check
    (Refer to Section 4-2-2 in Maintenance Manual Part 1.)
    (C014: CAPSTAN MOTOR)
13. Perform the Capstan FG Duty Adjust
    (Refer to Section 4-2-7 in Maintenance Manual Part 1.)
    (A003: CAPSTAN FG DUTY)
14. Perform the Capstan Free Speed Adjust
    (Refer to Section 4-2-7 in Maintenance Manual Part 1.)
    (A010: CAPSTAN FREE SPEED)
15. Perform the Adjusted Data Save
    (Refer to Section 4-2-7 in Maintenance Manual Part 1.)
    (A023: NV-RAM CONTROL)

Preparation

1. Turn the power off.
2. Remove the upper lid. (Refer to Section 2-3-1 in Maintenance Manual Part 1.)
3. Remove the plate MD assembly.
   (Refer to Section 2-4-2 in Maintenance Manual Part 1.)
4. Remove the cassette compartment.
   (Refer to Section 2-5 in Maintenance Manual Part 1.)
5. Remove the bottom plate with the right side panel of the unit down.
   (Refer to Section 2-3-1 in Maintenance Manual Part 1.)
6. Remove the plate HDD unit. (Refer to 5-31.)
7. Remove the DR-315 board. (Refer to 5-32-6.)

Tools

- Cleaning cloth : 3-184-527-01
- Cleaning fluid : 9-919-573-01

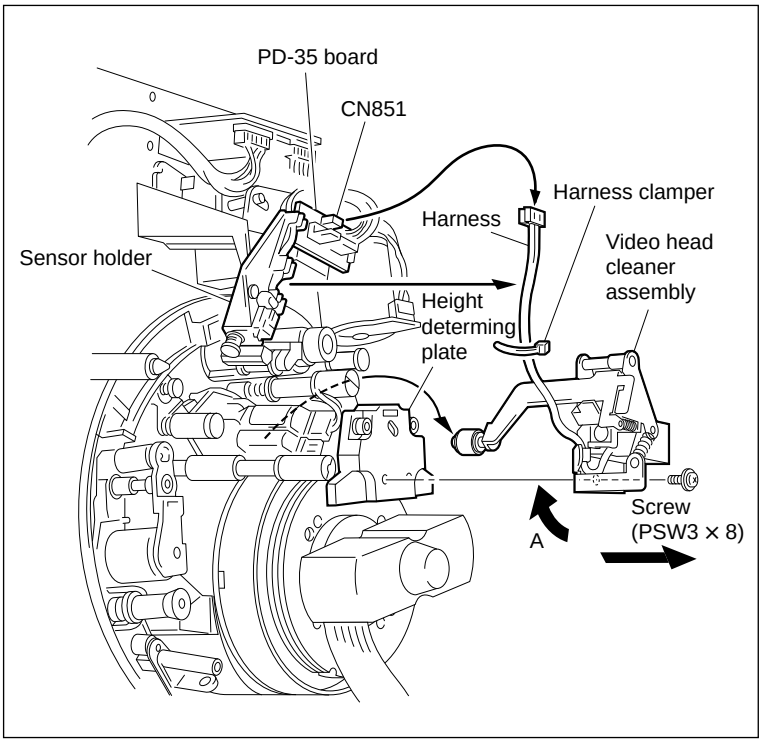
Removal

1. Remove the Video Head Cleaner Assembly

(1) Disconnect the harness from connector CN851 on the PD-35 board.
(2) Cut the harness clamper.
(3) Remove the harness from the sensor holder.
(4) Remove the screw, shift the video head cleaner assembly in the direction indicated by the arrow A, and remove it from the height determing plate.

Note

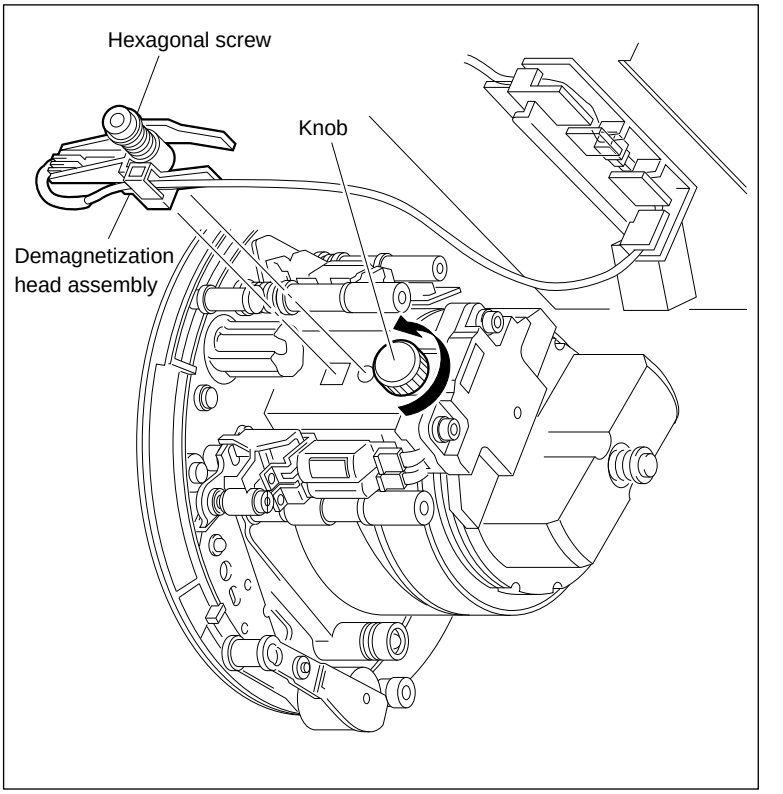
To remove the securing screws of the capstan motor, remove the video head cleaner assembly.



Remove the Video Head Cleaner Assembly

2. Remove the Demagnetization Head Assembly

(1) Turn the knob of the demagnetization head assembly counterclockwise about seven turns by finger.
(2) Loosen the hexagonal screw, then remove the demagnetization head assembly from the drum assembly.



Remove the Demagnetization Head Assembly

3. Remove the Capstan Motor

(1) Disconnect the harness from the connector on the capstan motor board.
(2) Remove the two screws while holding the capstan motor by hand.

Note

Be carefull not to fall the removed screw in the unit.

Installation

4. Attach the Capstan Motor

(1) Pass a new capstan motor through the hole of the chassis in the direction shown in the figure and tighten the two screws.

Notes

- Be careful not to drop the capstan motor.
- Be careful not to damage the capstan motor shaft when passing the capstan motor through the hole of the chassis.

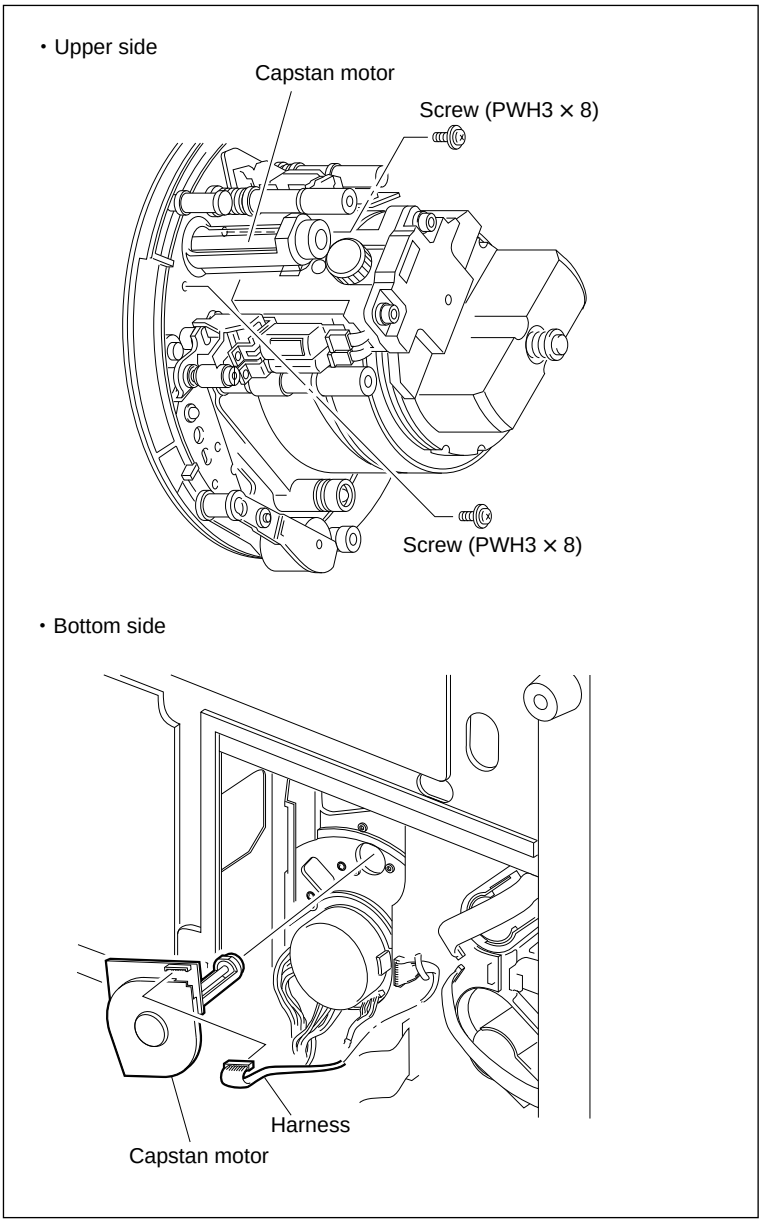
(2) Connect the harness disconnected in (1) of step 3 to the capstan motor board.

5. Attach the DR-315 Board

Refer to Section 5-32-6.

6. Attach the HDD Unit

Refer to Section 5-31.



Remove/Attach the Capstan Motor

7. Attach the Demagnetization Head Assembly

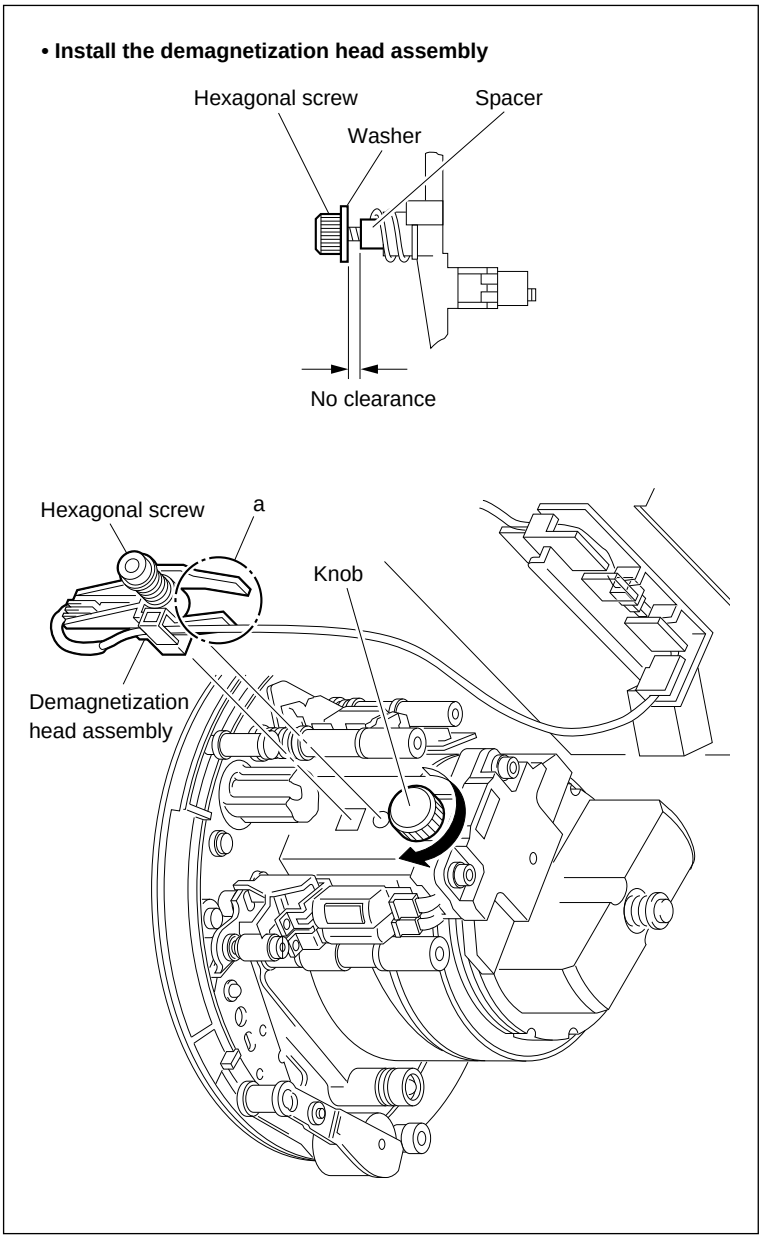
(1) Confirm that there is no clearance between the spacer and the washer of the demagnetization head assembly. (If clearance exists, tighten the hexagonal screw.)
Then insert the demagnetization head into the hole of the drum support, and tighten the hexagonal screw.

Tightening torque: 39.2×10^{-2} N • m
{4 kgf • cm}

Note

Put portion “a” of the demagnetization head assembly under the knob.

(2) Turn the knob of the demagnetization head clockwise with fingers and tighten the knob as far as it will go.



Attach the Demagnetization Head Assembly

8. Attach the Video Head Cleaner Assembly

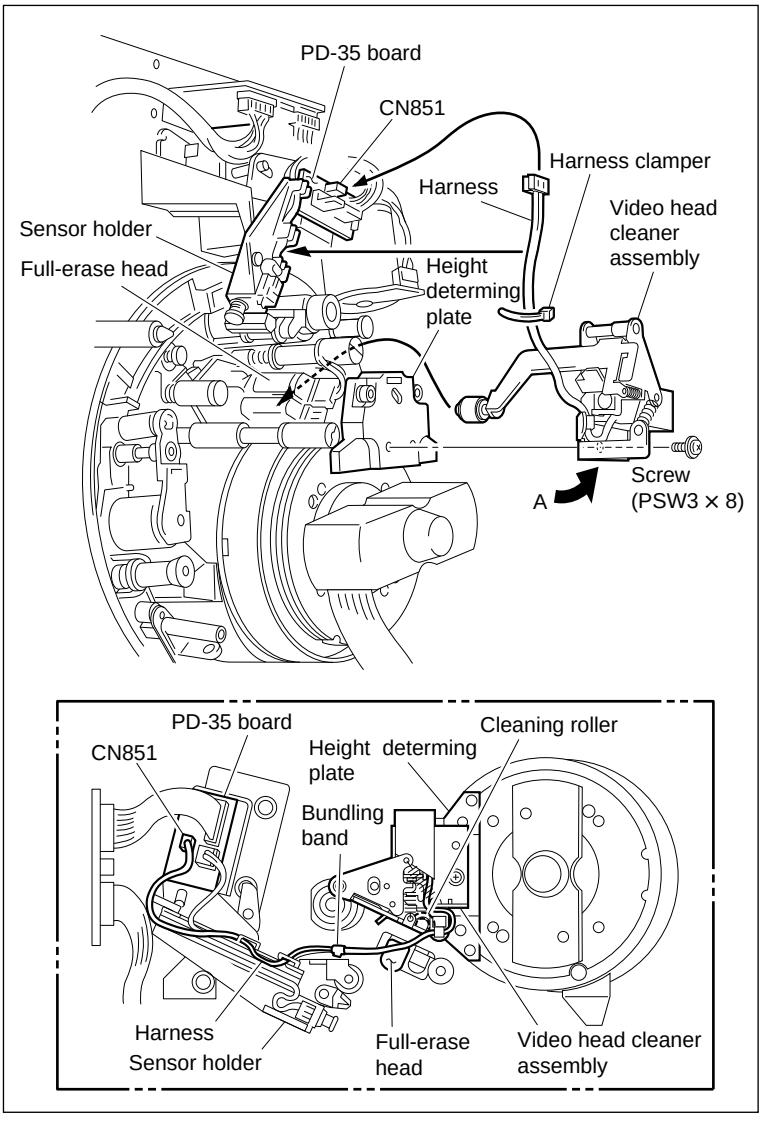
(1) Insert the cleaning roller into the clearance between the height determing plate and full erase head as shown in the figure.
(2) Adjust the position of the two pins of the video head cleaner assembly with the two holes of the height determing plate.
(3) Tighten the screw while pushing the video head cleaner assembly in the direction indicated by the arrow A.
(4) Fix the harness to the position on the sensor holder as shown in the figure.
(5) Connect the harness to connector CN851 on the PD-35 board.
(6) Bind the harnesses of the full-erase head and the video head cleaner assembly with a new harness clamper (or the equivalent).
(7) Adjust the position of the cleaning roller. (Refer to step 5 in Section 5-4.)

9. Cleaning

Clean the capstan motor shaft using a cleaning cloth moistened with cleaning fluid.

Note

After cleaning, wipe using a dry cleaning cloth.



Attach the Video Head Cleaner Assembly

Adjustment after Replacement

10. Confirm the Pinch Press Clearance

Refer to Section 5-12-2.

11. Confirm the Tape Running

Refer to Section 7-1-2.

12. Perform the Capstan Motor Operation Check

Refer to Section 4-2-2 in Maintenance Manual Part 1.
(C014: CAPSTAN MOTOR)

13. Perform the Capstan FG Duty Adjust

Refer to Section 4-2-7 in Maintenance Manual Part 1.
(A003: CAPSTAN FG DUTY)

14. Perform the Capstan Free Speed Adjust

Refer to Section 4-2-7 in Maintenance Manual Part 1.
(A010: CAPSTAN FREE SPEED)

15. Perform the Adjusted Data Save

Refer to Section 4-2-7 in Maintenance Manual Part 1.
(A023: NV-RAM CONTROL)

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5-11. AT Head Replacement

Outline

Replacement

1. Remove the CL Guide Rail
2. Disconnect the Harnesses
3. Remove the AT Head Assembly
4. Remove the AT Head
5. Mount the AT Head
6. Attach the AT Head Assembly
7. Connect the Harness
8. Attach the CL Guide Rail
9. Cleaning (AT Head Surface)

Adjustment after Replacement

10. Adjust the AT Head Zenith (Refer to Section 7-1-1.)
11. Adjust the Tape Running (Refer to Section 7-1-2.)
12. Adjust the AT Head Height (Refer to Section 7-1-6.)
13. Adjust the AT Head Azimuth (Refer to Section 7-1-7.)
14. Adjust the AT Head Head-to-tape Contact (Refer to Section 7-1-8.)
15. Adjust the AT Head Position (Refer to Section 7-1-9.)
16. Confirm the Audio Level in REV Mode (Refer to Section 7-1-10.)
17. Confirm the Video Tracking (Refer to Section 7-1-3.)
18. Confirm the Tape Running (Refer to Section 7-1-2.)
19. Reform the Electrical Adjustment after AT Head Replacement
    (Refer to Section 6-4.)

Preparation

1. Turn the power off.
2. Remove the upper lid. (Refer to Section 2-3-1 in Maintenance Manual Part 1.)
3. Remove the plate MD assembly.
   (Refer to Section 2-4 in Maintenance Manual Part 1.)
4. Remove the cassette compartment.
   (Refer to Section 2-5 in Maintenance Manual Part 1.)

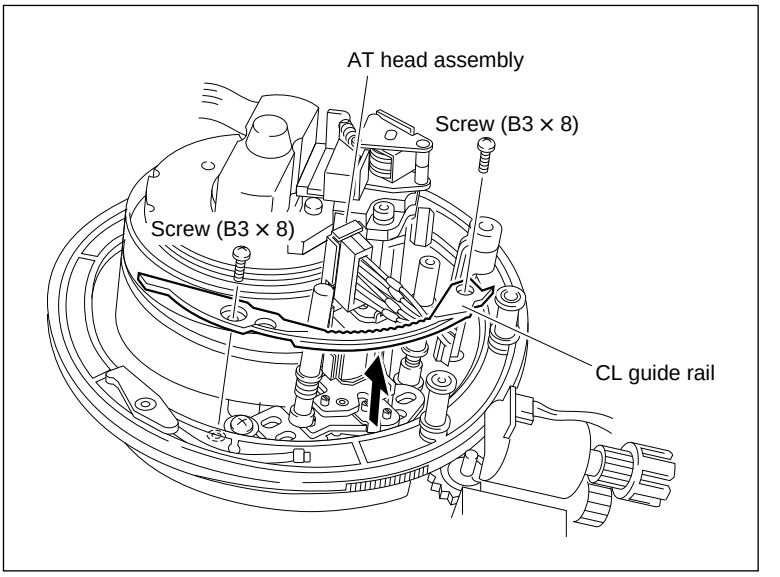
Tools

- Cleaning cloth: 3-184-527-01
- Cleaning fluid: 9-919-573-01
- Torque screwdriver (6 kg•cm) (JB-5251): J-6252-510-A
- Torque screwdriver’s bit (+2 mm, l = 75 mm): J-6323-420-A

Removal

1. Remove the CL Guide Rail

Remove the two screws, and remove the CL guide rail.



Remove the CL Guide Rail

2. Disconnect the Harness

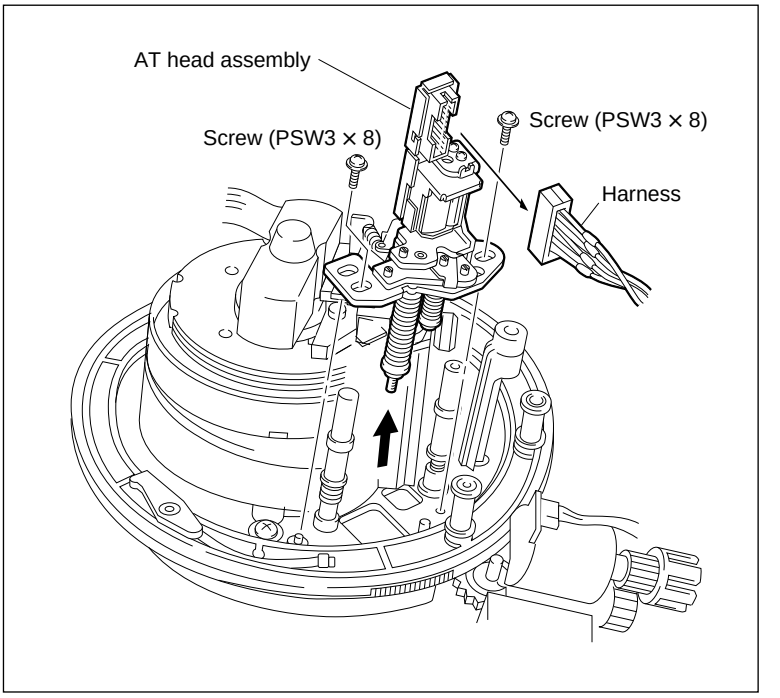
Disconnect the harness from the connector of the AT head assembly.

3. Remove the AT Head Assembly

Remove the two screws, then remove the AT head assembly from the unit.

Note

Be careful not to touch the drum (especially video heads). Also, take care not to damage the peripheral tape guides.



Remove the AT Head Assembly

4. Remove the AT Head

(1) Remove the two screws, then remove the AT head and adjustment plate from the AT bracket.
(2) Remove the AT shield case.

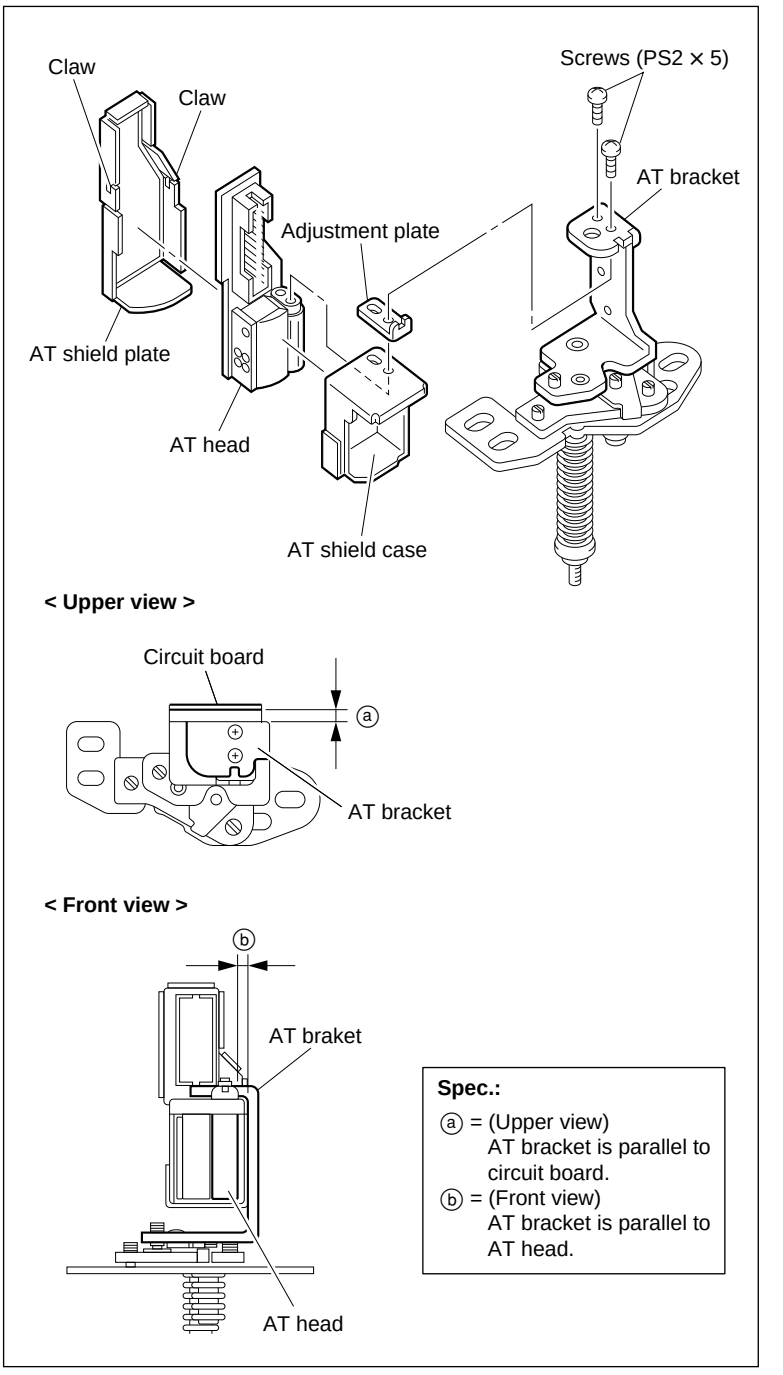
Installation

5. Mount the AT Head

(1) Put a new head into the AT shield case and align the hole positions.
(2) Align the hole positions while putting the adjustment plate between the AT head and the AT bracket, then temporaly tighten the two screws.
(3) Tighten the screws after confirming that the specification is satisfied.

Tightening torque: 19.6×10^{-2} N • m
{2.0 kg • cm}

(4) Cover the AT shield plate on the AT head board.
Then, fix the AT shield plate by bending the two claws using the long-nose plier.



Remove/Mount the AT Head

6. Attach the AT Head Assembly

(1) Align the two longitudinal holes of the AT head assembly with the two bosses of the chassis.

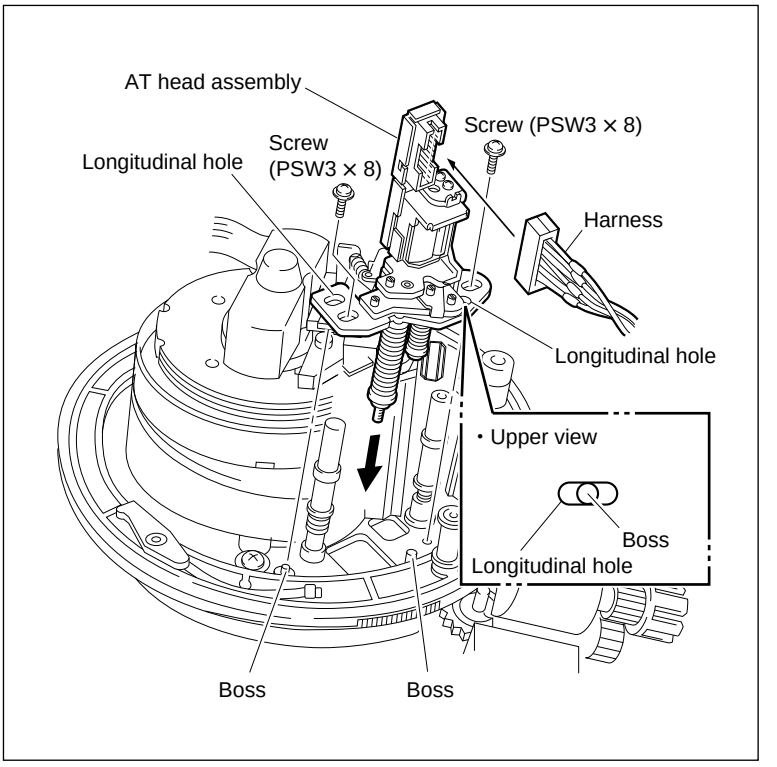
Notes

- Be careful not to touch the drum (especially video heads). Also, take care not to damage the peripheral tape guides.
- Be careful not to damage the AT head surface.

(2) Align the bosses of the chassis with center of the longitudinal holes and tighten the two screws.

7. Connect the Harness

Connect the harness to the connector of the AT head assembly.



Attach the AT Head Assembly

8. Attach the CL Guide Rail

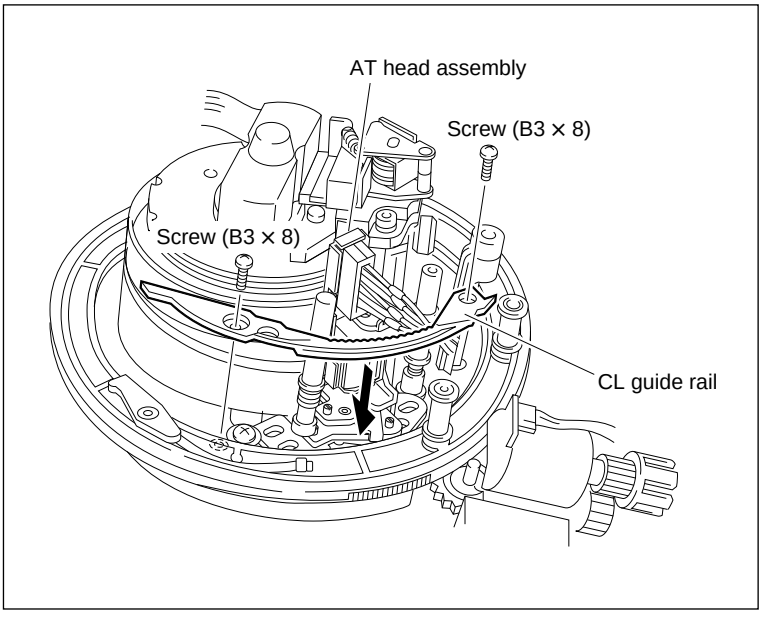
Attach the CL guide rail with the two screws.

9. Cleaning

Clean the AT head surface using a cleaning cloth moistened with cleaning fluid.
(Refer to Section 5-2-5 in Maintenance Manual Part 1.)

Note

After cleaning, wipe using a dry cleaning cloth.



Attach the CL Guide Rail

Adjustment after Replacement

10. Adjust the AT Head Zenith
Refer to Section 7-1-1.

11. Adjust the Tape Running
Refer to Section 7-1-2.

12. Adjust the AT Head Height
Refer to Section 7-1-6.

13. Adjust the AT Head Azimuth
Refer to Section 7-1-7.

14. Adjust the AT Head Head-to-tape Contact
Refer to Section 7-1-8.

15. Adjust the AT Head Position
Refer to Section 7-1-9.

16. Confirm the Audio Level in REV Mode
Refer to Section 7-1-10.

17. Confirm the Video Tracking
Refer to Section 7-1-3.

18. Confirm the Tape Running
Refer to Section 7-1-2.

19. Perform the Electrical Adjustment after AT Head Replacement
Refer to Section 6-4.

5-12. Pinch Solenoid Replacement

Replace the pinch solenoid earlier time either 6,000 hours of tape running or 200,000 times of the threading.

5-12-1. Replacement Procedure of the Pinch Solenoid

Outline

Replacement

1. Disconnect the Harnesses (CN851, CN854/PD-35 Board)
2. Remove the Pinch Press Assembly
3. Remove the PD-35 Board
4. Remove the Pinch Stopper
5. Remove the Pinch Solenoid
6. Attach the Pinch Solenoid
7. Attach the Pinch Stopper
8. Attach the PD-35 Board
9. Attach the Pinch Press Assembly
10. Connect the Harnesses (CN851, CN854/PD-35 Board)

Adjustment after Replacement

11. Confirm the Pinch Solenoid Operation
    (Refer to Section 4-2-2 in Maintenance Manual Part 1.)
    (C020: PINCH ROLLER)
12. Adjust the Pinch Press Clearance (Refer to Section 5-12-2.)

Preparation

1. Turn the power off.
2. Remove the upper lid. (Refer to Section 2-3-1 in Maintenance Manual Part 1.)
3. Remove the plate MD assembly.
   (Refer to Section 2-4 in Maintenance Manual Part 1.)
4. Remove the cassette compartment.
   (Refer to Section 2-5 in Maintenance Manual Part 1.)

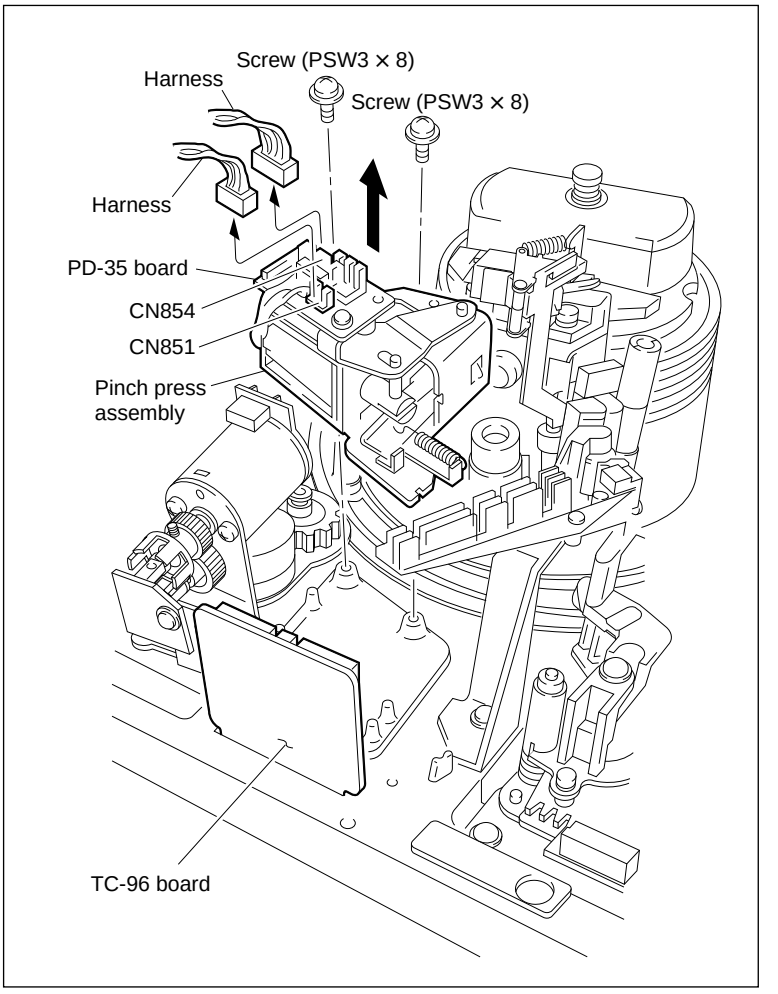
Removal

1. Disconnect the Harnesses

Disconnect the two harnesses from CN851 and CN854 on the PD-35 board.

2. Remove the Pinch Press Assembly

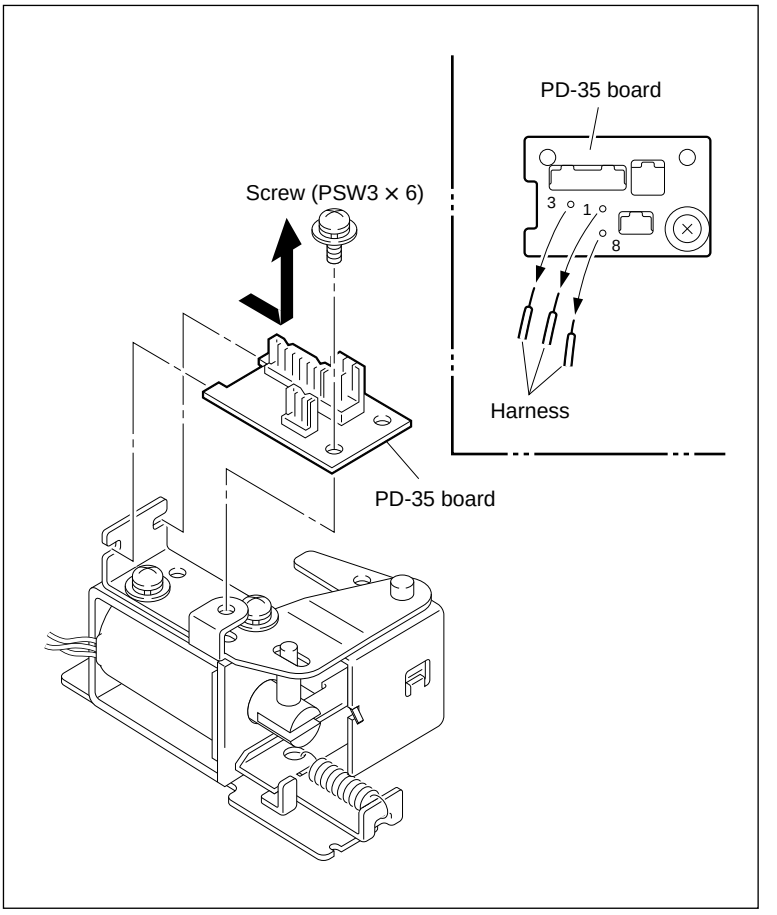
Remove the two screws, then remove the pinch press assembly from the unit.



Remove the Pinch Press Assembly

3. Remove the PD-35 Board

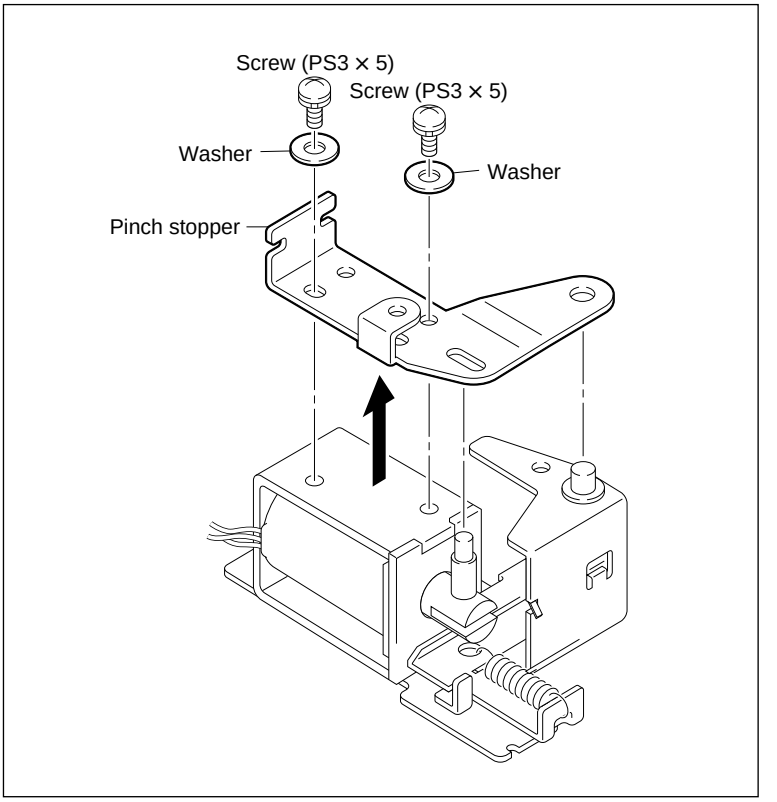
(1) Remove the screw, then remove the PD-35 board from the pinch press assembly.
(2) Unsolder the three harness soldered on the PD-35 board.



Remove the PD-35 Board

4. Remove the Pinch Stopper

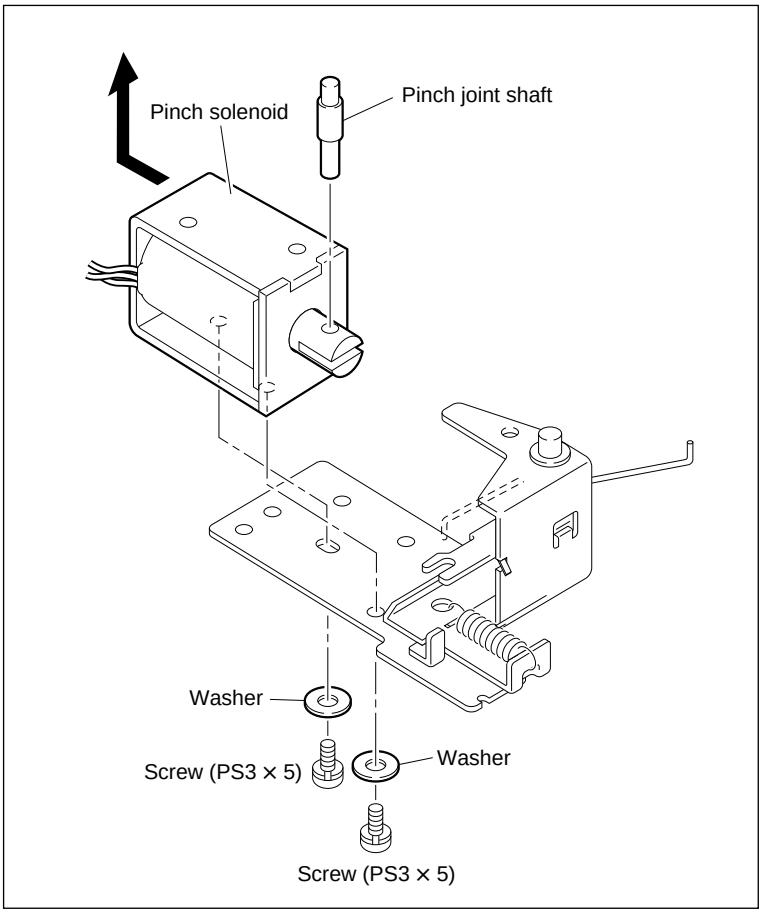
Remove the two screws and washers, then remove the pinch stopper.



Remove the Pinch Stopper

5. Remove the Pinch Solenoid

(1) Extract the pinch joint shaft.
(2) Remove the two screws and washers, then remove the pinch solenoid.



Remove the Pinch Solenoid

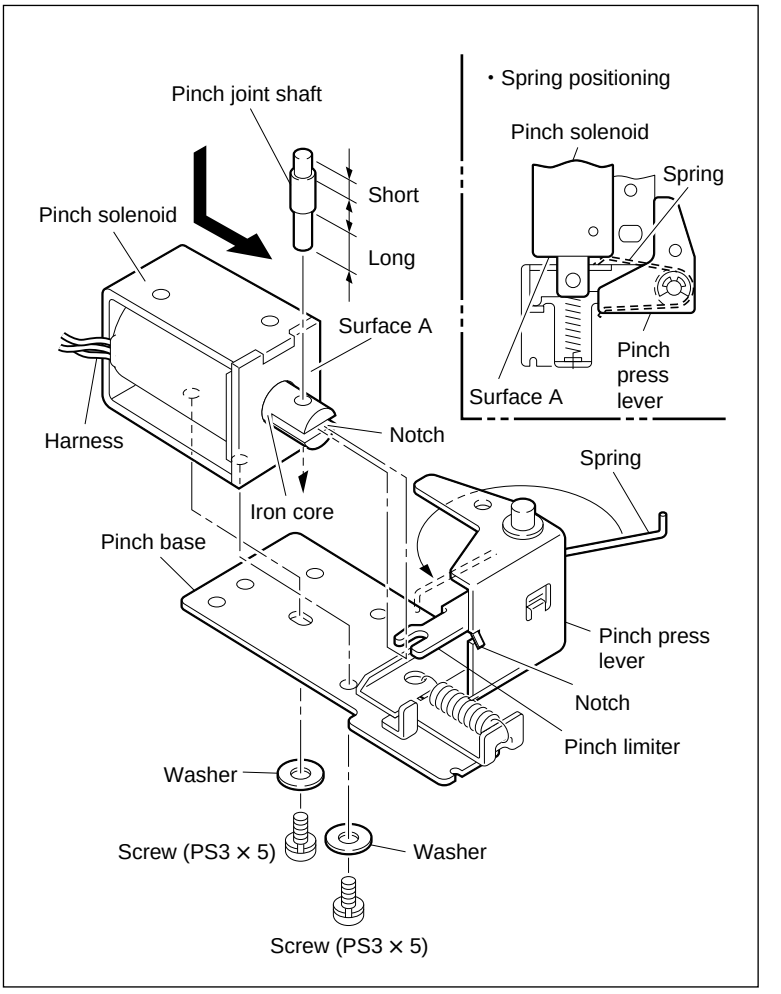
Installation

6. Attach the Pinch Solenoid

(1) Set a new solenoid to the pinch base in the direction shown in the figure.
(2) Bend the spring in the direction indicated by the arrow and bring it into contact with surface A of the solenoid shown in the figure.
(3) Put the pinch limiter into the notch of the solenoid's iron core and pass the pinch joint shaft through the hole of the iron core in the direction shown in the figure.
(4) Put the two washers and tighten the two screws.

Tightening torque: 98×10^{-2} N • m
{10.0 kgf • cm}

(5) Confirm that the other end of the spring is put on the notch of the pinch press lever.



Attach the Pinch Solenoid

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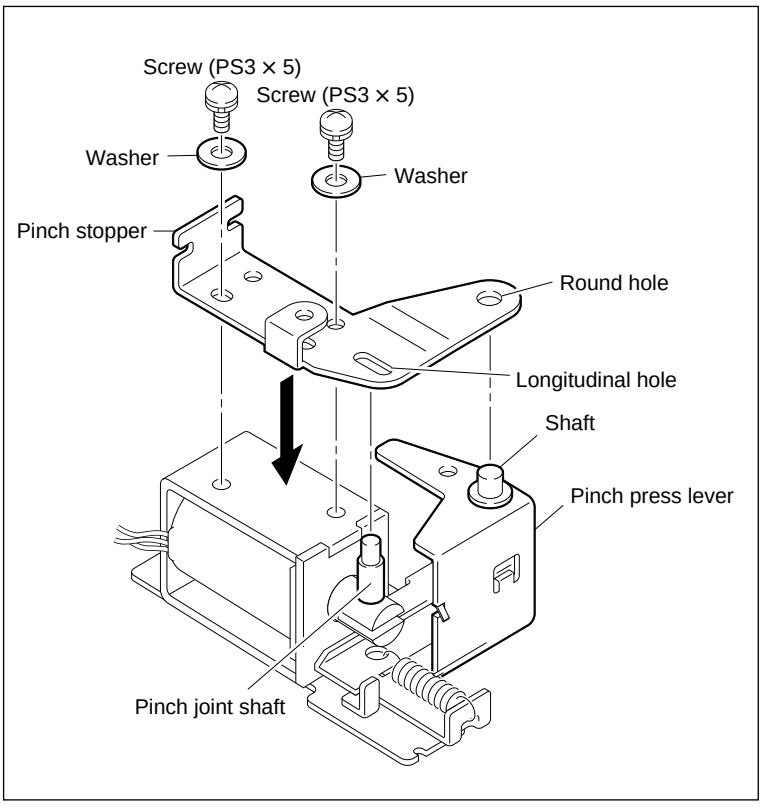
7. Attach the Pinch Stopper

(1) Pass the longitudinal hole of the pinch stopper to the pinch joint shaft, then pass the round hole to the shaft of the pinch press lever.

(2) Put the washers and tighten the screws.

Tightening torque: 98×10^{-2} N • m
{10.0 kgf • cm}

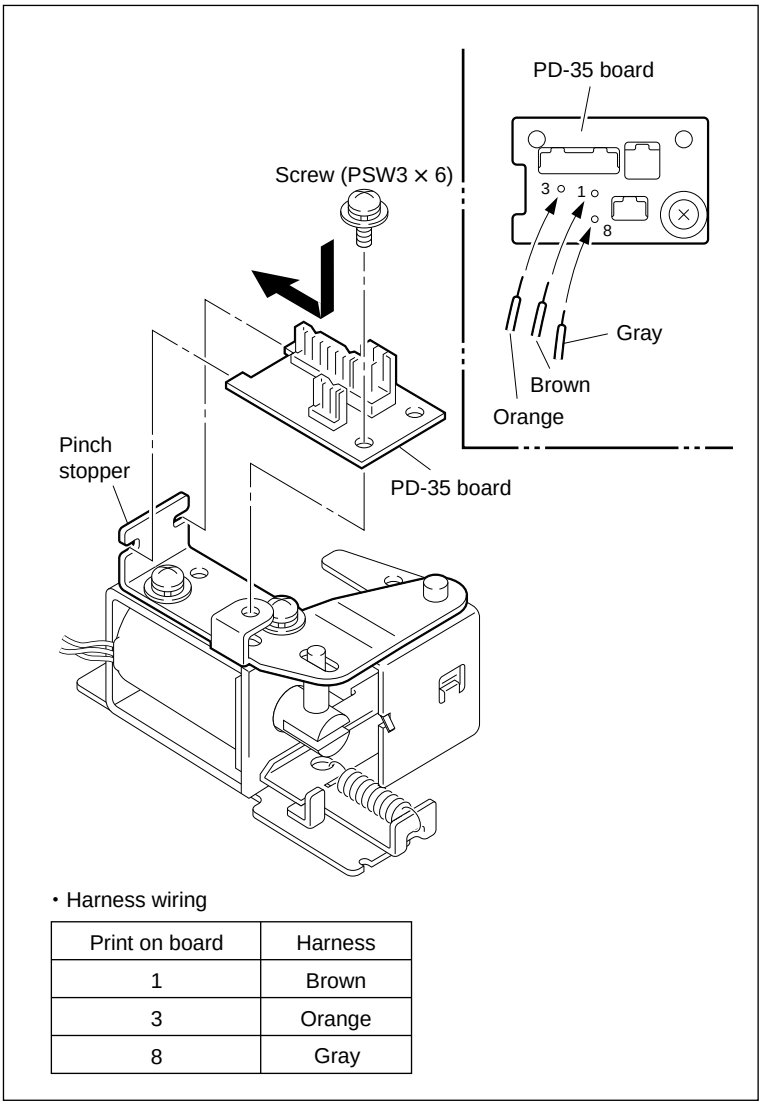


Attach the Pinch Stopper

8. Attach the PD-35 Board

(1) Solder the three wire of the harness to the PD-35 board as shown in the figure, then solder.

(2) Insert the PD-35 board into the pinch stopper and tighten the screw.



• Harness wiring

Print on board	Harness
1	Brown
3	Orange
8	Gray

Attach the PD-35 Board

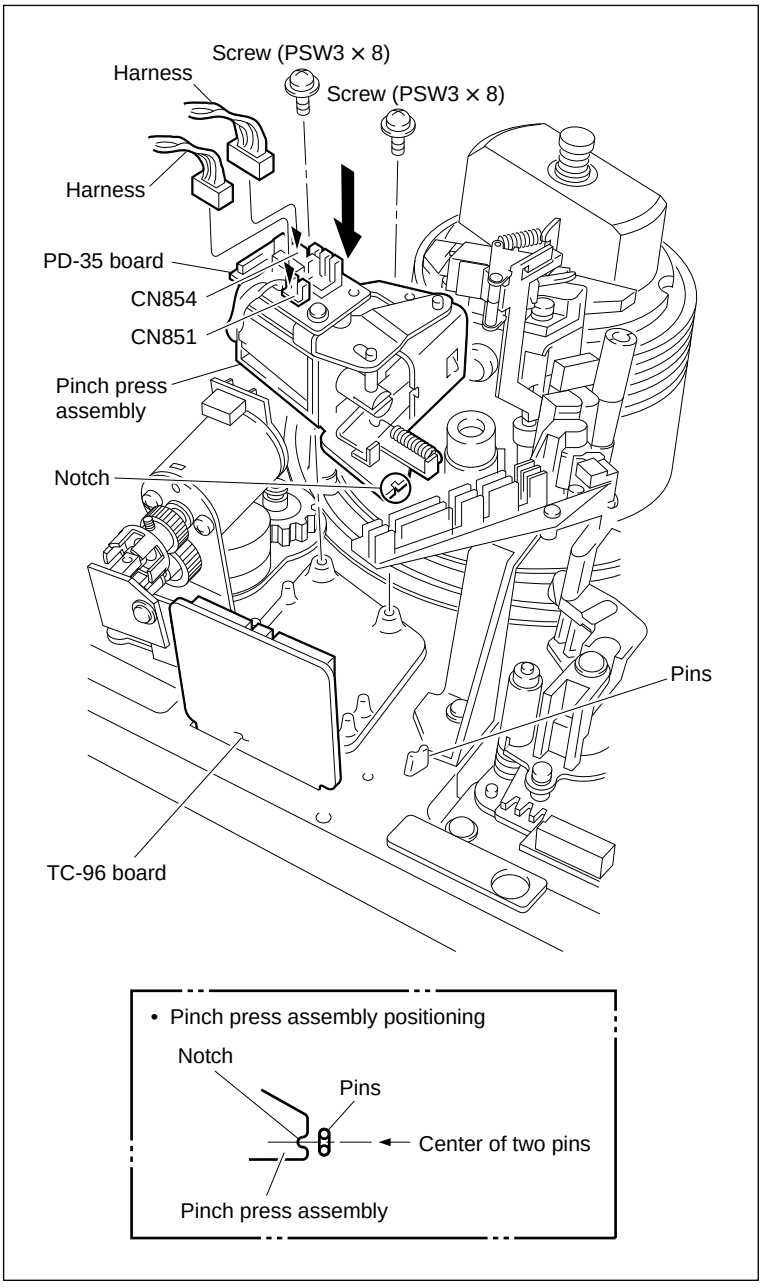
9. Attach the Pinch Press Assembly

Align the notch of the pinch press assembly with the center of the two pins and tighten the two screws.

Tightening torque: 98×10^{-2} N•m
{10.0 kgf • cm}

10. Connect the Harneeses

Connect the harnesses to CN851 and CN854 on the PD-35 board.



Attach the Pinch Press Assembly

Adjustment after Replacement

11. Confirm the Pinch Solenoid Operation

Refer to Section 4-2-2 in Maintenance Manual Part 1.
(C020: PINCH ROLLER)

12. Adjust the Pinch Press Clearance

Refer to Section 5-12-2.

5-12-2. Pinch Press Clearance Adjustment

Note

- Be sure to check the clearance at pinch press is energized state when the pinch press assembly is removed.

Tool

- Wire clearance check gauge set: J-6152-450-A

Check

1. Put the Pinch Solenoid into the Energized State

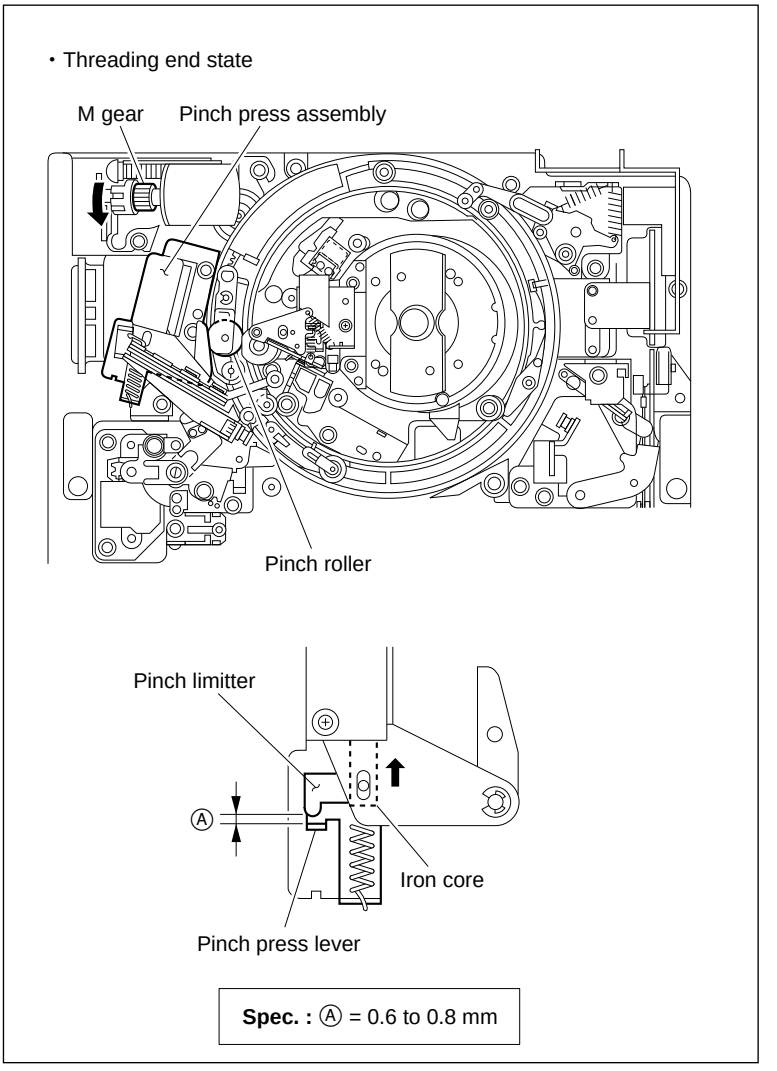
(1) Turn the M gear of the gear box assembly manually, and put the unit into the threading end mode.

(2) Press the iron core of the pinch solenoid in the direction of the fully energized state.

2. Check the Pinch Press Clearance

Check that the clearance between the pinch limiter and pinch press lever satisfies the specification.

If the specification is not satisfied, perform steps 3 and later.



Pinch Press Clearance Check

Adjustment

3. Loosen Screws

Loosen the two screws securing the pinch press assembly by 1/2 to one turn.

4. Adjust the Pinch Press Assembly Position

Put the pinch solenoid into the energized state, then insert the tip of a 3 mm flat-blade screwdriver into the notch of the pinch press assembly and adjust the pinch press assembly position so that the specification is satisfied.

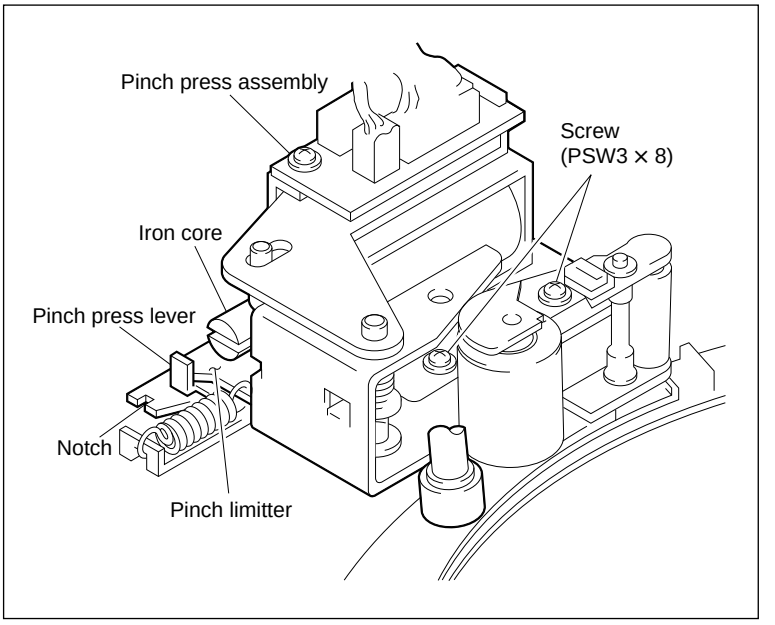
5. Tighten Screws

Tighten the two screws loosened in step 3.

Tightening torque: 98×10^{-2} N • m
{10.0 kgf • cm}

6. Recheck the Pinch Press Clearance

Refer to steps 1 and 2.

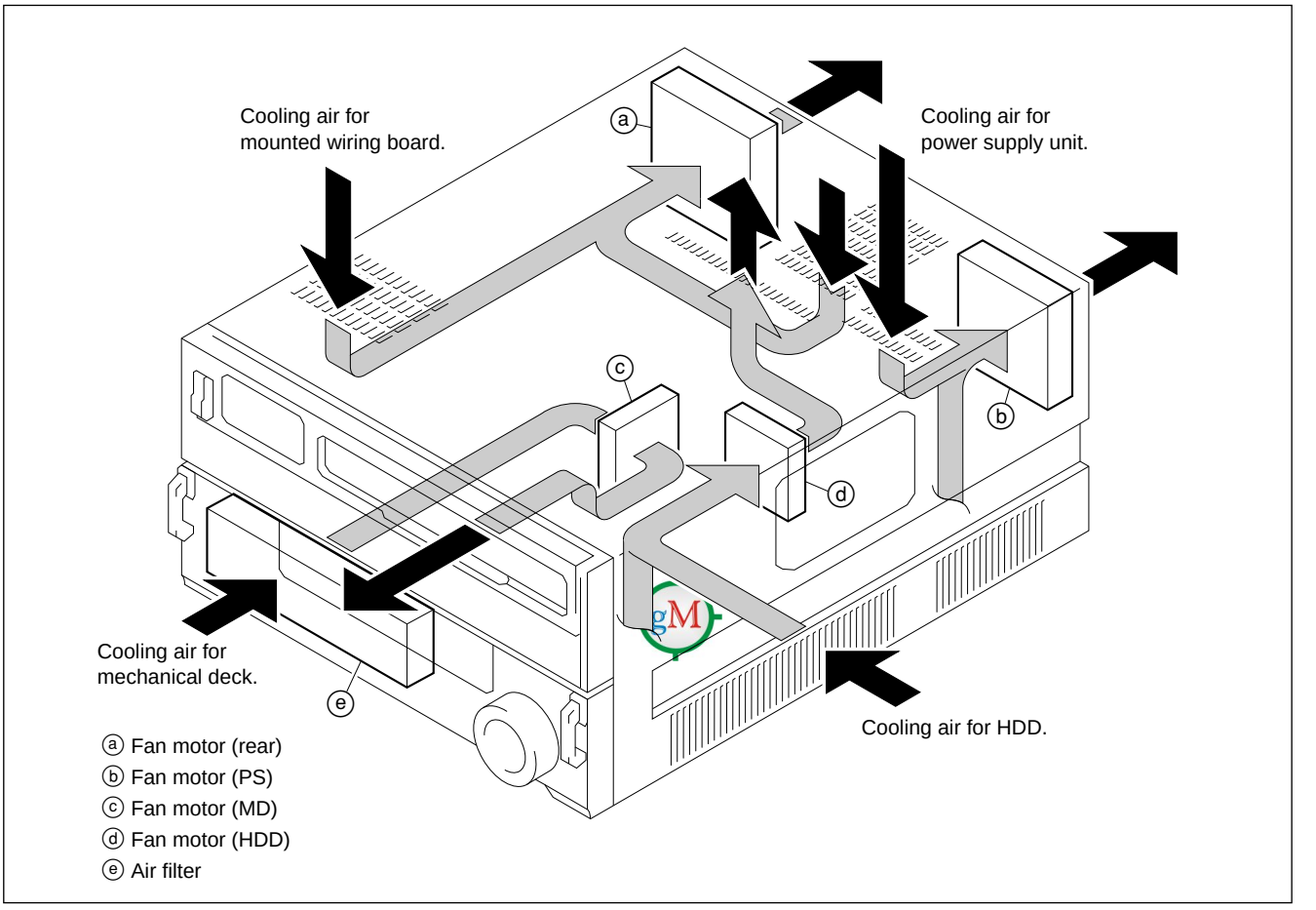


Adjust the Pinch Press Clearance

5-13. Fan Motor Replacement

This unit has four fan motors. Replace each fan motors every 40,000 hours of energizing.

1. Index



2. Notes

- Replace the fan motors when displaying a alarm informing for fan motor in addition to the periodic replacement.
- When the fan motor stops because of trouble, some components inside the unit may be heated to high temperatures.
  Take care not to burn your hands by touching these components.
  In service operation, turn off the power and perform the service operation after the temperatures turns to ordinary state.

5-13-1. Fan Motor (Rear) Replacement

Outline

Replacement

1. Remove the Connector Panel
2. Remove the Fan Motor (Rear)
3. Attach the Fan Motor (Rear)
4. Attach the Connector Panel

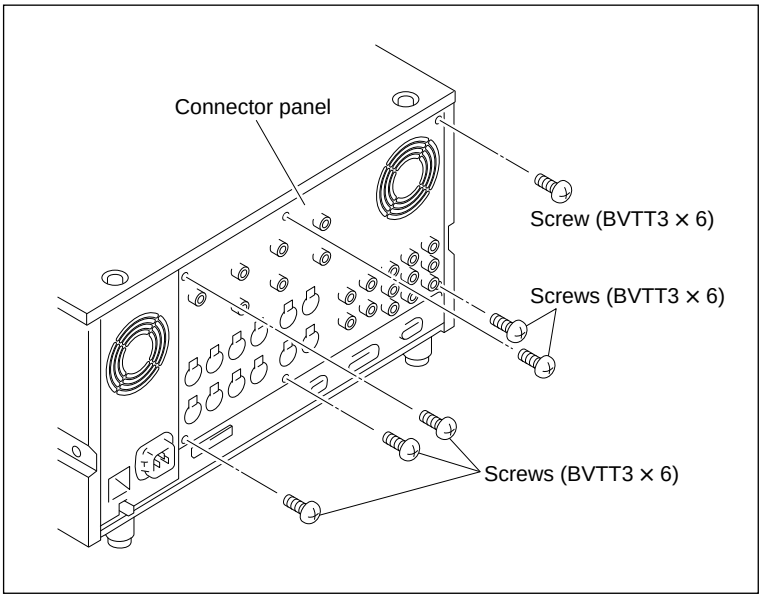
Removal

1. Remove the Connector Panel

Remove the six screws and remove the connector panel.

Note

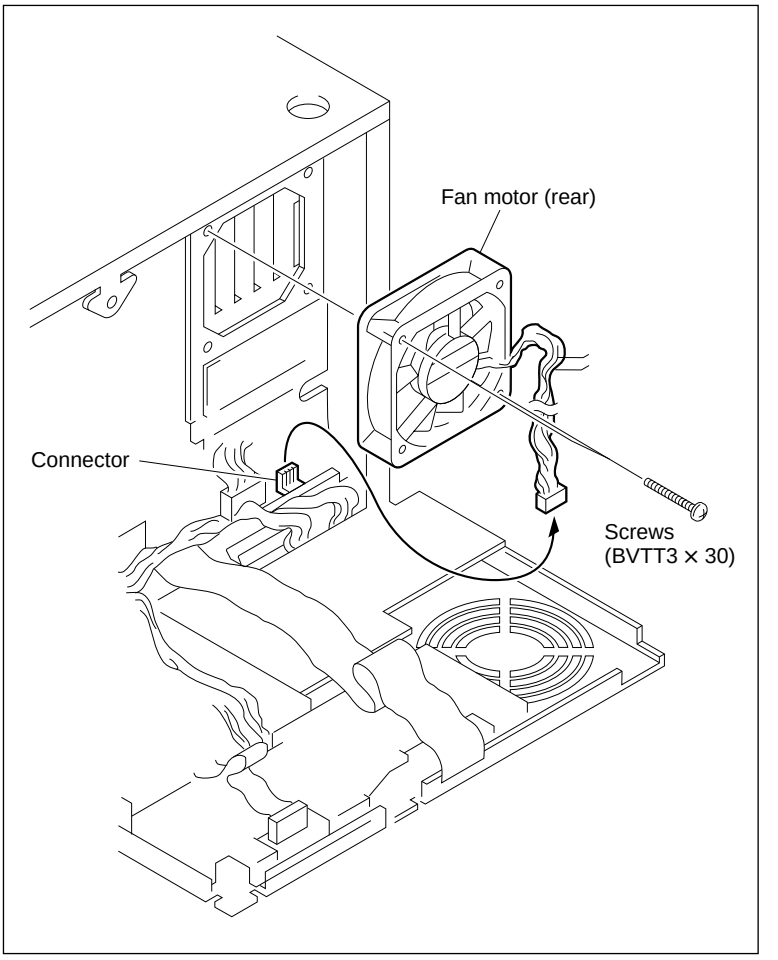
It is not neccessary to disconnect the harnesses connected to the connector panel.



Remove the Connector Panel

2. Remove the Fan Motor (Rear)

(1) Disconnect the harness of the fan motor (rear) from the connector shown in the figure.
(2) Remove the two screws and remove the fan motor (rear).



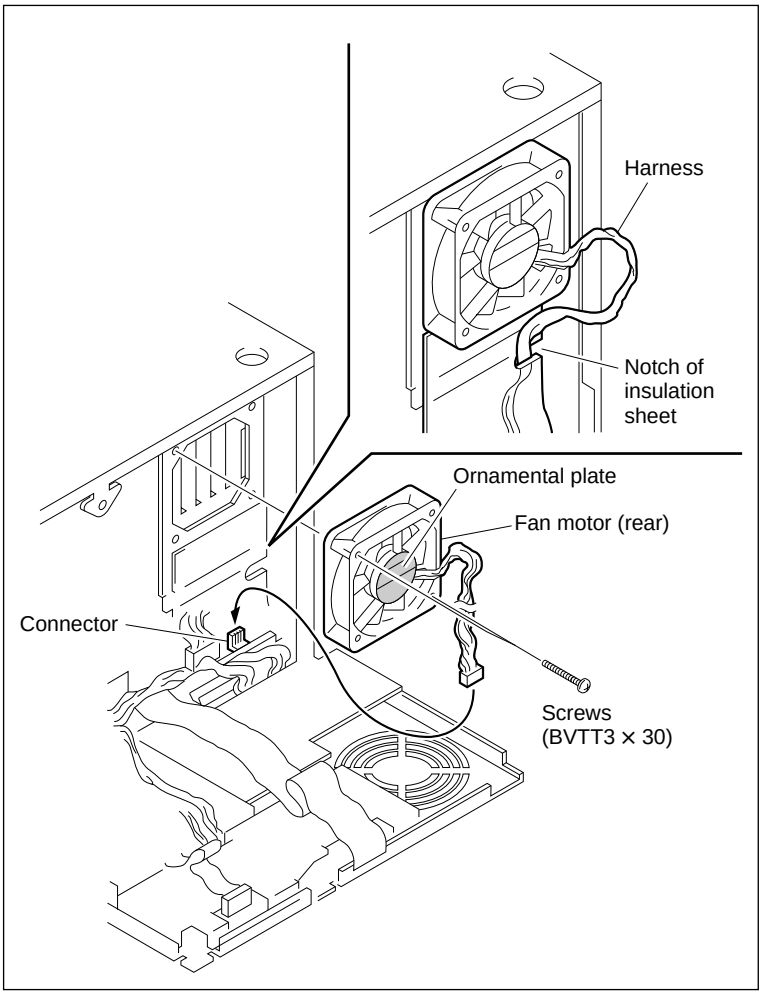
Remove the Fan Motor (Rear)

3. Attach the Fan Motor (Rear)

(1) Attach a new fan motor (rear) so that the ornamental plate faces to outside and harness is bottom right side, and tighten the two screws.
(2) Thread the harness of the fan motor (rear) in the notch of the insulation sheet.
(3) Connect the harness of the fan motor (rear) to the connector.

4. Attach the Connector Panel

Attach the connector panel with the six screws.



Attach the Fan Motor (Rear)

5-13-2. Fan Motor (PS) Replacement

Outline

Replacement

1. Remove the Power Supply Panel
2. Remove the Fan Motor (PS)
3. Attach the Fan Motor (PS)
4. Attach the Power Supply Panel

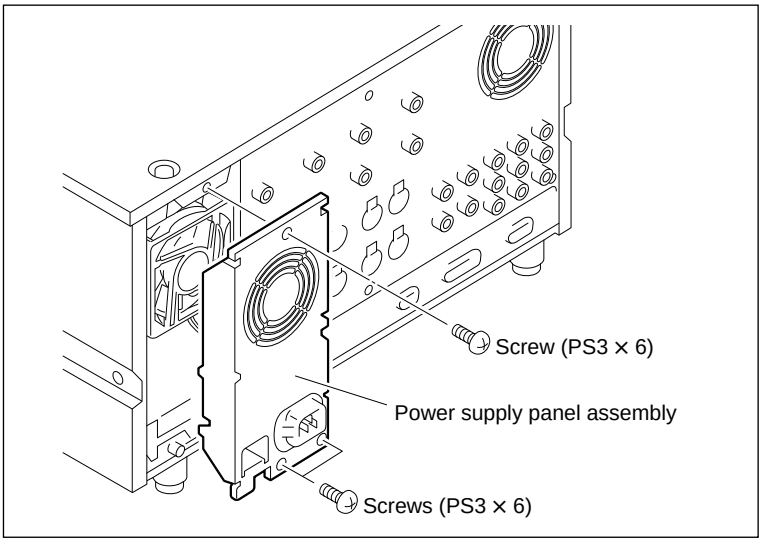
Removal

1. Remove the Power Supply Panel Assembly

Remove the three screws and remove the power supply panel assembly.

Note

It is not neccessary to disconnect the harness connected to the power supply panel.



Remove the Power Supply Panel Assembly

2. Remove the Fan Motor (PS)

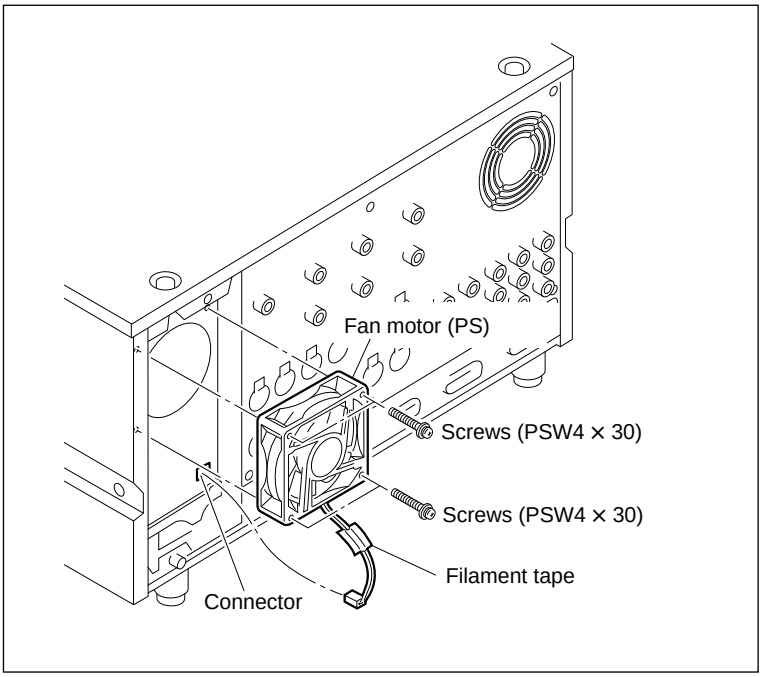
(1) Take off the filament tape fixing the harness of the fan motor (PS).
(2) Disconnect the harness of the fan motor (PS) from the connector shown in the figure.
(3) Remove the four screws and remove the fan motor (PS).

3. Attach the Fan Motor (PS)

(1) Attach a new fan motor (PS) so that the ornamental plate faces to outside and harness is bottom left side, and tighten the four screws.
(2) Connect the harness of the fan motor (PS) to the connector.
(3) Stick a filament tape to fix the harness of the fan motor (PS).

4. Attach the Power Supply Panel

Install the power supply panel assembly with the three screws.



Remove/Attach the Fan Motor (PS)

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5-13-3. Fan Motor (HDD) and Fan Motor (MD) Replacement

Outline

Replacement

1. Remove the Bottom Plate
2. Remove the Hard Disk Drive Unit
3. Remove the DR-315 Board
4. Replace the Fan Motor (HDD)
5. Replace the Fan Motor (MD)
6. Attach the Fan Motor (MD)
7. Attach the Fan Motor (HDD)
8. Attach the DR-315 Board
9. Attach the Hard Disk Drive Unit
10. Attach the Bottom Plate

Note

When replacing the fan motor (HDD) and the fan motor (MD), the hard disk drive unit has to be removed. The handling of the removed hard disk drive unit should be complied with “Caution for Handling the Unit with Build-in HDDs (for Part 2)” (descrived after Manual Structure), and perform operations with extra care not to apply any shocks to the hard disk drive unit.

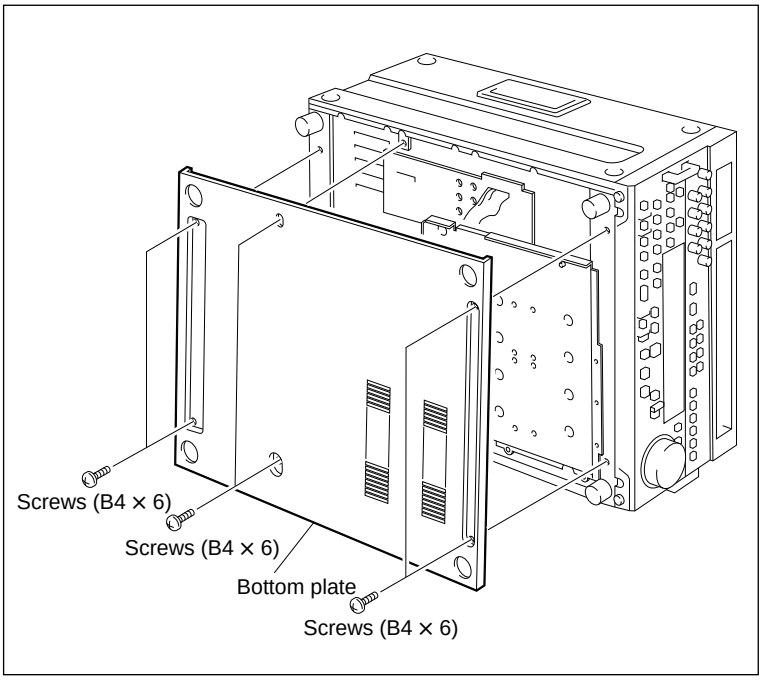
Removal

1. Remove the Bottom Plate

(1) Place the unit on its right side panel down.
(2) Remove the six screws and remove the bottom plate.

2. Remove the Hard Disk Drive Unit

Remove the hard disk drive unit.
(Refer to Section 5-31-2.)



Remove the Bottom Plate

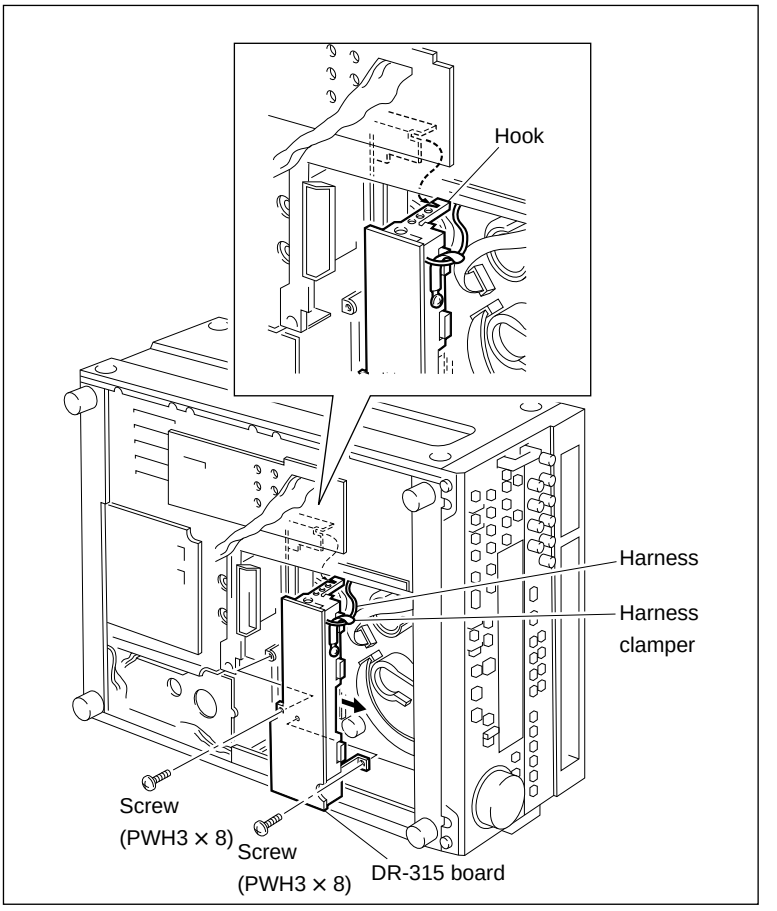
3. Remove the DR-315 Board

(1) Strech the harness clamper and release the harness.
(2) Remove the two screws shown in the figure.
(3) Move the DR-315 board in the direction of the reel motors, and detach the hook.

Note

The hook is hard to be seen since it is the inner part.

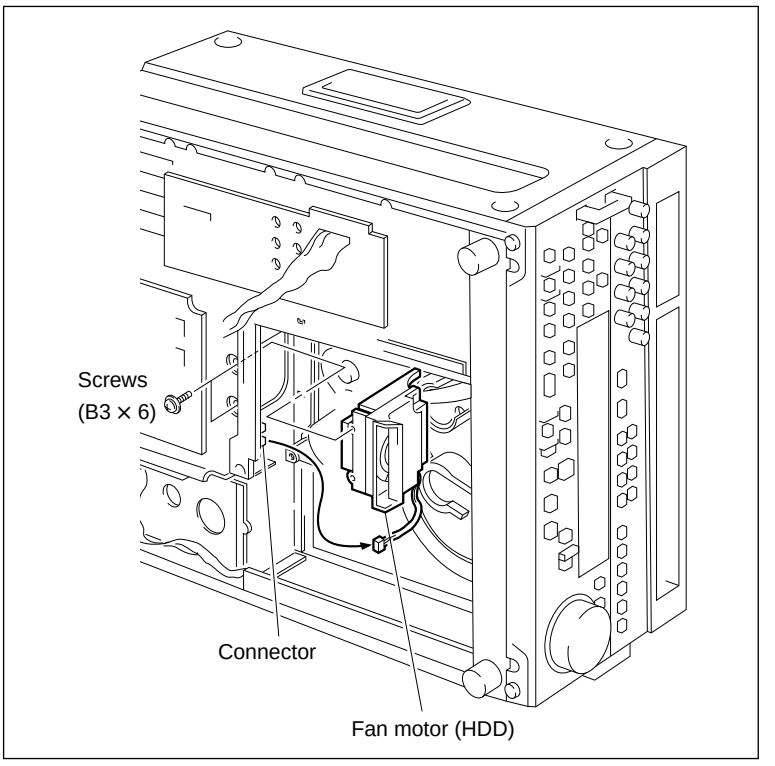
(4) Pull out the DR-315 board as far as possible with connectors are connected state.



Remove the DR-315 Board

4. Replace the Fan Motor (HDD)

(1) Disconnect the harness from the connector shown in the figure.
(2) Remove the two screws and remove the fan motor (HDD).

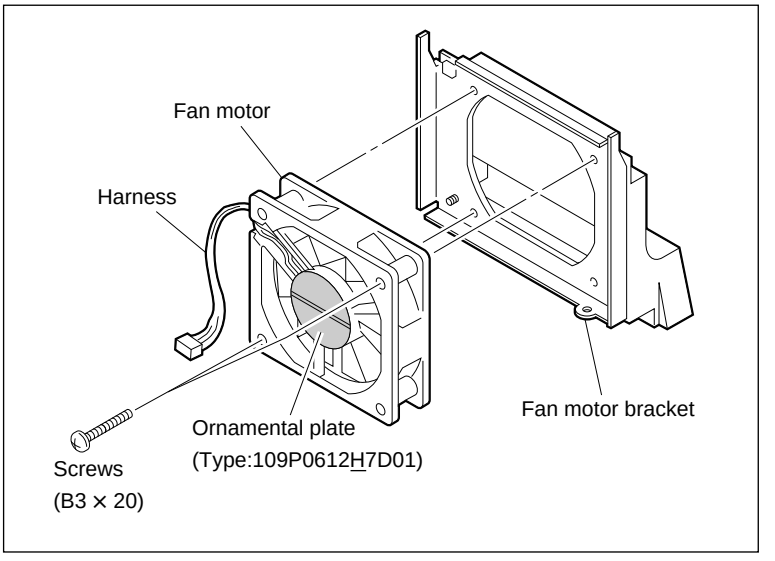


Replace the Fan Motor (HDD)

(3) Remove the two screws and remove the fan motor (HDD) from the fan motor bracket.
(4) Attach the fan motor (HDD) to the fan motor bracket so that the ornamental plate faces to the opposite side of the fan motor bracket and the harness is top left side, and tighten the two screws.

Note

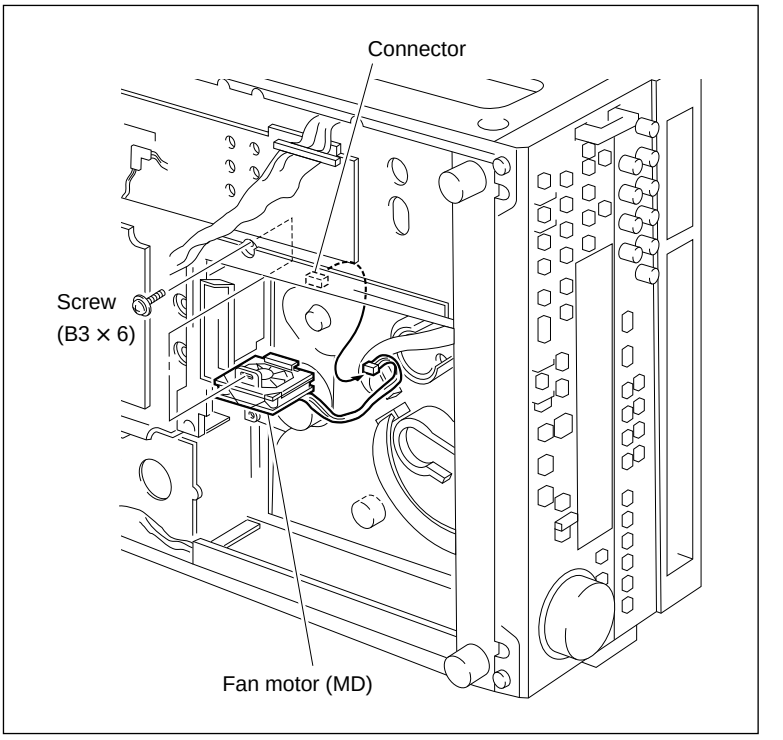
The type of this fan motor (HDD) is "109P0612H7D01".
Take care to use the correct type since the sharpes of the fan motor (HDD) and the fan motor (MD) are the same.



Replace the Fan Motor (HDD)

5. Replace the Fan Motor (MD)

(1) Disconnect the harness from the connector (CN161) shown in the figure.
(2) Remove the screw and remove the fan motor (MD).

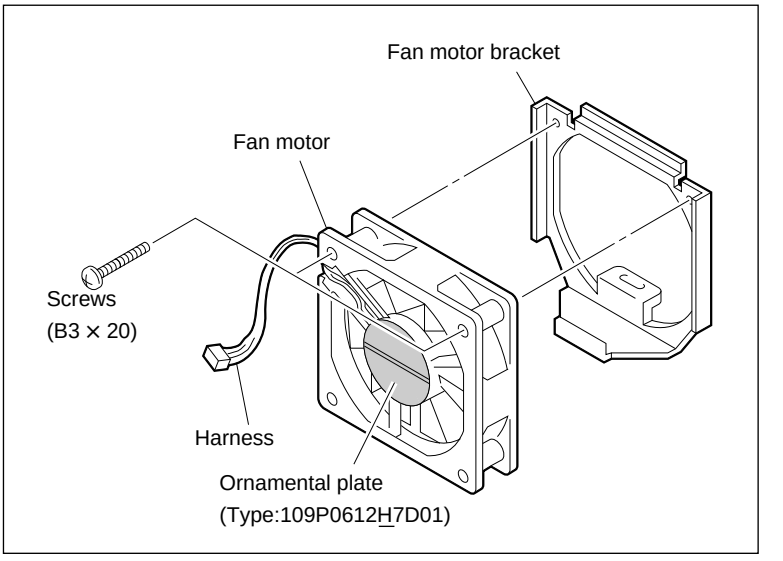


Replace the Fan Motor (MD)

(3) Remove the two screws and remove the fan motor (MD) from the fan motor bracket.
(4) Attach the fan motor (MD) to the fan motor bracket so that the ornamental plate faces to the opposite side of the fan motor bracket and the harness is top left side, and tighten the two screws.

Note

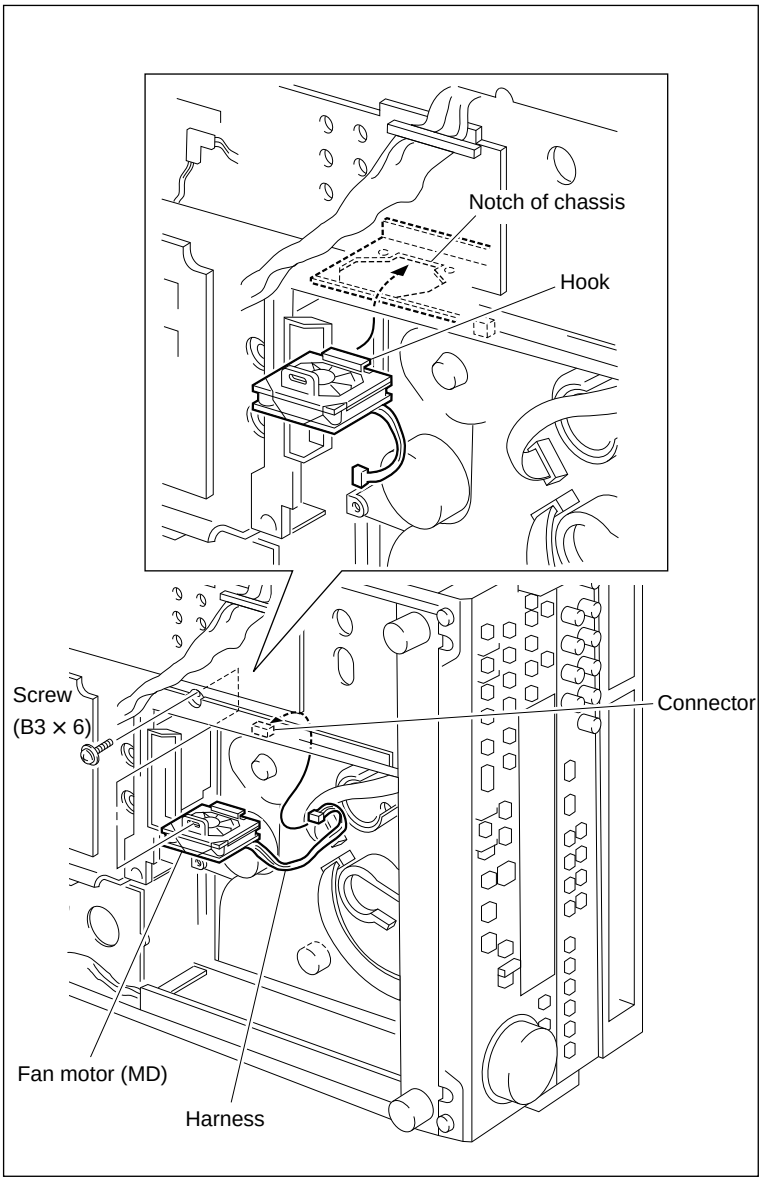
The type of this fan motor (MD) is "109P0612M7D01".
Take care to use the correct type since the sharpes of the fan motor (MD) and the fan motor (HDD) are the same.



Replace the Fan Motor (MD)

6. Attach the Fan Motor (MD)

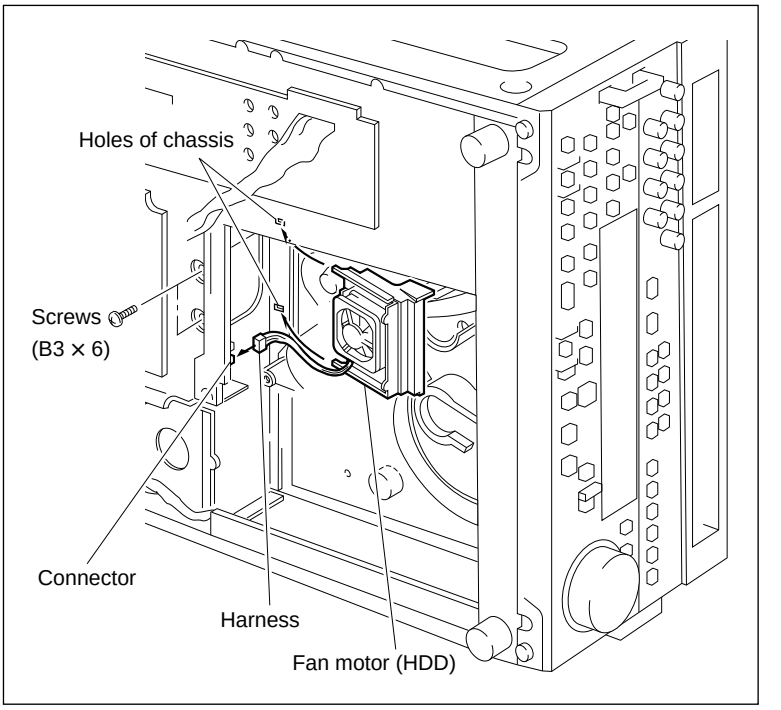
(1) Put the hook of the fan motor bracket to the notch of the chassis.
(2) Attach the fan motor (MD) with the screw.
(3) Connect the harness of the fan motor (MD) to the connector (CN161).



Attach the Fan Motor (MD)

7. Attach the Fan Motor (HDD)

(1) Put the tips of the fan motor bracket to the two holes of the chassis shown in the figure.
(2) Attach the fan motor (HDD) with the two screws.
(3) Connect the harness of the fan motor (HDD) to the connector.



Attach the Fan Motor (HDD)

8. Attach the DR-315 Board

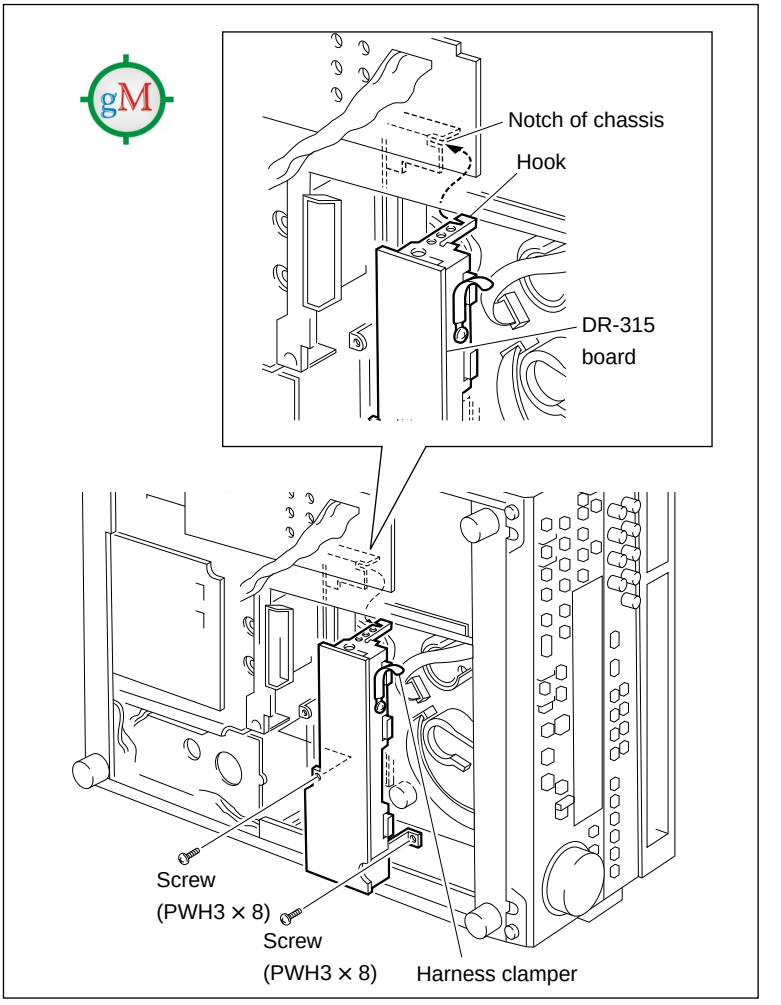
(1) Hook the DR-315 board to the notch of the chassis shown in the figure.
(2) Fix the DR-315 board with the two screws.
(3) Clamp the harness released in the step 3-(1) with the harness clamper.

9. Attach the Hard Disk Drive Unit

Attach the hard disk drive unit.
(Refer to Section 5-31-2.)

10. Attach the Bottom Plate

Attach the bottom plate with the six screws.



Attach the DR-315 Board

5-14. Brush Slip Ring Assembly Replacement

Replace the brush slip ring assembly every 6,000 hours of the drum rotating.

Outline

Replacement

1. Remove the Flexible Board (CN2/SE-341 Board)
2. Remove the Brush Slip Ring Assembly
3. Cleaning (Contact Portion of the DR-294 Board and Installation Surface of Brush Slip Ring Assembly)
4. Attach the Brush Slip Ring Assembly
5. Connect the Flexible Board (CN2/SE-341 Board)

Adjustment after Replacement

6. Check the RF (Refer to Section 4-2-3 in Maintenance Manual Part 1.) (C1: RF CHECK)

Note

Replace the brush slip ring assembly when the brush or slip ring is worn or damaged. The brush slip ring assembly cannot be replaced by only the brush or slip ring.

Preparation

1. Turn off the power.
2. Remove the upper lid. (Refer to Section 2-3-1 in Maintenance Manual Part 1.)
3. Remove the plate MD assembly. (Refer to Section 2-4 in Maintenance Manual Part 1.)
4. Remove the cassette compartment assembly. (Refer to Section 2-5 in Maintenance Manual Part 1.)

Tools

- Torque screwdriver (6 kg • cm)(JB-5251): J-6252-510-A
- Torque screwdriver's bit (+2 mm, l = 75 mm): J-6323-420-A
- Cleaning cloth: 3-184-527-01
- Cleaning fluid: 9-919-573-01

Removal

1. Remove the Flexible Board

Remove the flexible board from the connector CN2 on the SE-341 board.

2. Remove the Brush Slip Ring Assembly

(1) Remove the two screws, then remove the brush slip ring assembly.

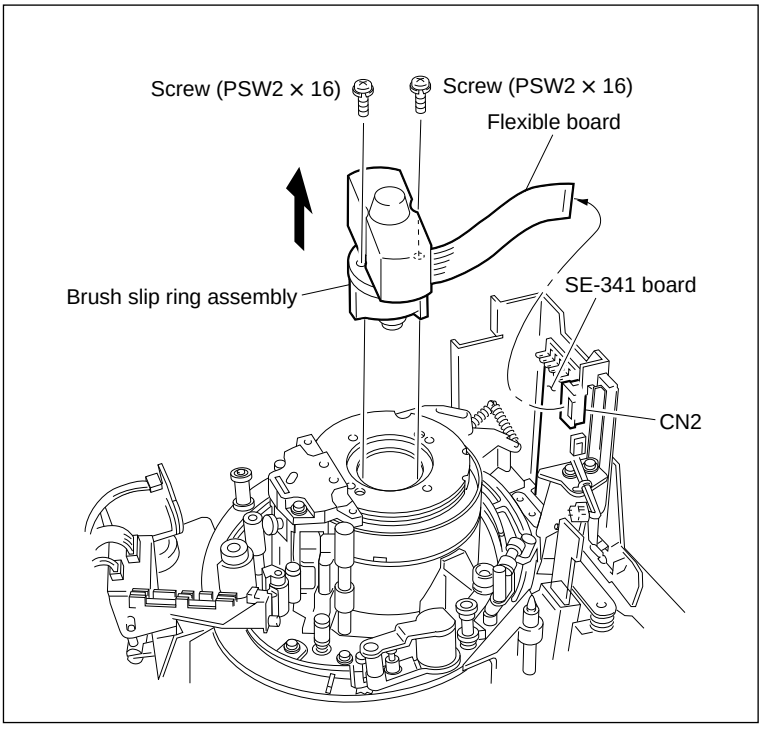
Note

Do not apply any force forcibly to the brush slip ring assembly at that time.

(2) Turn the brush slip ring assembly upside down and take out the screws.

Note

Be careful not to drop the screws in the cover at that time.



Remove the Brush Slip Ring Assembly

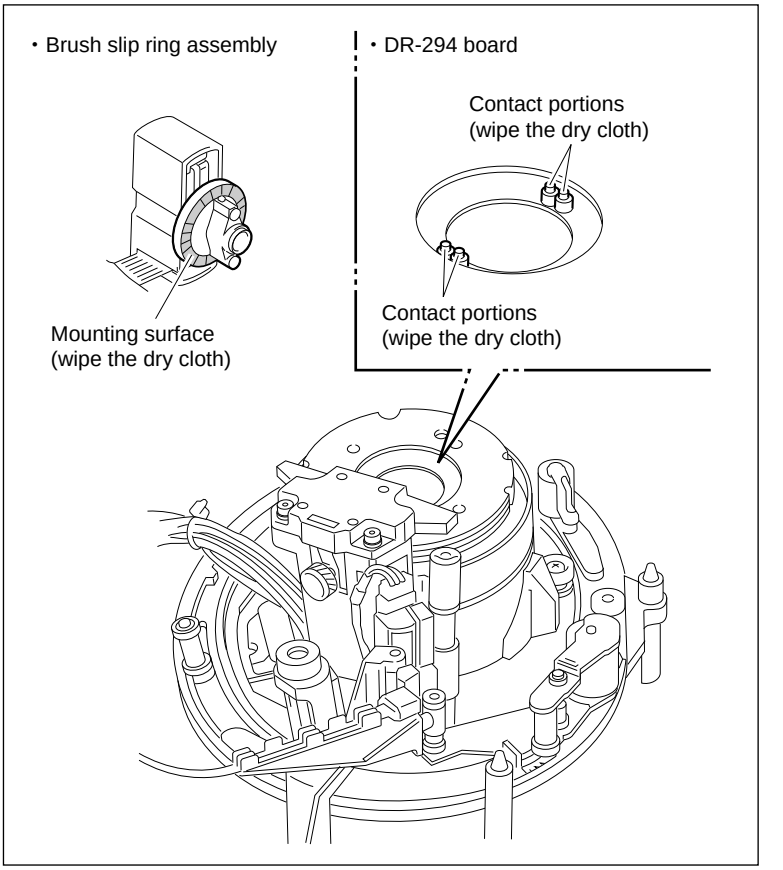
Installation

3. Cleaning

Wipe the mounting surface (the portion in the figure) of the brush slip ring assembly and the contact portions of the DR-294 board with dry cloth.

Note

Never apply cleaning fluid to the contact portions.

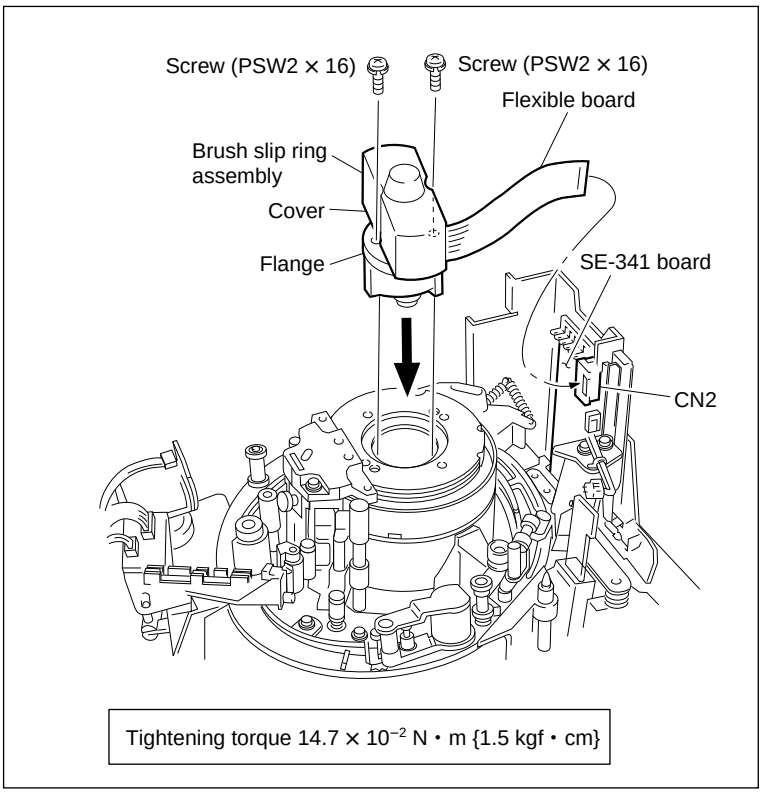


Cleaning

4. Attach the Brush Slip Ring Assembly

(1) Insert the two screws taken out in (2) of step 2 into the screw holes of the brush slip ring assembly.
(2) Attach the brush slip ring assembly in the direction shown in the figure.
(3) Tighten the two screws alternately and gradually while uniformly pushing both sides of the flange.

Tightening torque: 14.7×10^{-2} N • m
{1.5 kgf • cm}



Attach the Brush Slip Ring Assembly

5. Connect the Flexible Board

Insert the flexible board into the connector CN2 on the SE-341 board, then lock.

Adjustment after Replacement

6. Check the RF

Refer to Section 4-2-3 in Maintenance Manual Part 1.
(C1: RF CHECK)

5-15. Brake Solenoid Replacement

Outline

Replacement

1. Reel Table Assembly Removal
2. Crank Arm and Slide Shaft Support Removal
3. RS Table Block Assembly Removal
4. Harnesses Disconnection (CN926 and CN927 on RM Board)
5. Reel Motor Assembly Removal
6. Brake Assembly Removal
7. Brake Solenoid Removal
8. Brake Solenoid Installation
9. Brake Assembly Installation
10. Cleaning (Reel Motor Assembly)
11. Reel Motor Assembly Installation
12. Harnesses Connection (CN926 and CN927 on RM Board)
13. Flat Cable Connection
14. Slide Shaft Installation
15. RS Table Block Assembly Installation
16. Applying Grease to Slide Shaft
17. Crank Arm Installation

Adjustment after Replacement

18. Reel Motor Shaft Slantness Confirmation (Refer to Section 5-9-2.)
19. Reel Table Assembly Installation
20. Cassette Holder Post Height Confirmation (Refer to Section 5-9-3.)
21. Reel Table Height Confirmation (Refer to Section 5-9-4.)
22. Reel Brake Clearance Confirmation (Refer to Section 5-9-5.)
23. Reel Brake Release Confirmation (Refer to Section 5-9-6.)
24. Brake Solenoid Operation Confirmation (Refer to Section 4-2-2 in Maintenance Manual Part 1.)
    (C021: S REEL BRAKE, C022: T REEL BRAKE)

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Notes

- The brake solenoid replacement and its adjustment after replacement are the same on the supply (S) and take-up (T) sides.
- Use a new E ring when the brake solenoid is replaced.
  E ring (2.3): 7-624-105-04

Preparation

1. Turn off the power.
2. Remove the upper lid. (Refer to Section 2-3-1 in Maintenance Manual Part 1.)
3. Remove the plate MD assembly. (Refer to Section 2-4 in Maintenance Manual Part 1.)
4. Remove the cassette compartment assembly. (Refer to Section 2-5 in Maintenance Manual Part 1.)

Tools

- L wrench (d = 1.5 mm): 7-700-736-05
- Torque screwdriver (12 kg • cm)(JB-5252): J-6252-520-A
- Torque screwdriver's bit (+3 mm, l = 90 mm): J-6323-430-A
- Grease (SGL-601): 7-651-000-10
- Oil: 7-661-018-18
- Cleaning cloth: 3-184-527-01
- Cleaning fluid: 9-919-573-01

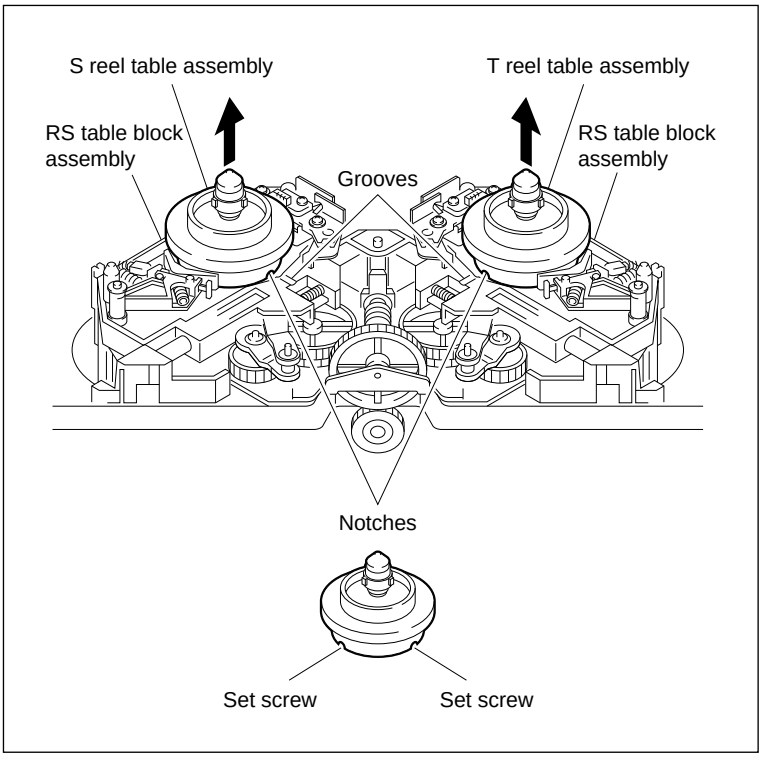
Removal

1. Reel Table Assembly Removal

(1) Align one of the two notches at the bottom of the reel table assembly with the groove position of the RS table block assembly.
(2) Insert the L wrench into the notch at the bottom of the reel table assembly along the groove of the RS table block assembly.
(3) Loosen the set screw.
(4) Align the other notch at the bottom of the reel table assembly with the groove position of the RS table block assembly.
(5) Loosen the set screw in the same way as in step (2).
(6) Remove the reel table assembly.

Note

A polywasher may be attached together when the reel table assembly is removed. In this case, remove the polywasher from the reel table assembly and return it to the reel motor shaft. The polywasher is used for reel table height adjustment.



Reel Table Assembly Removal

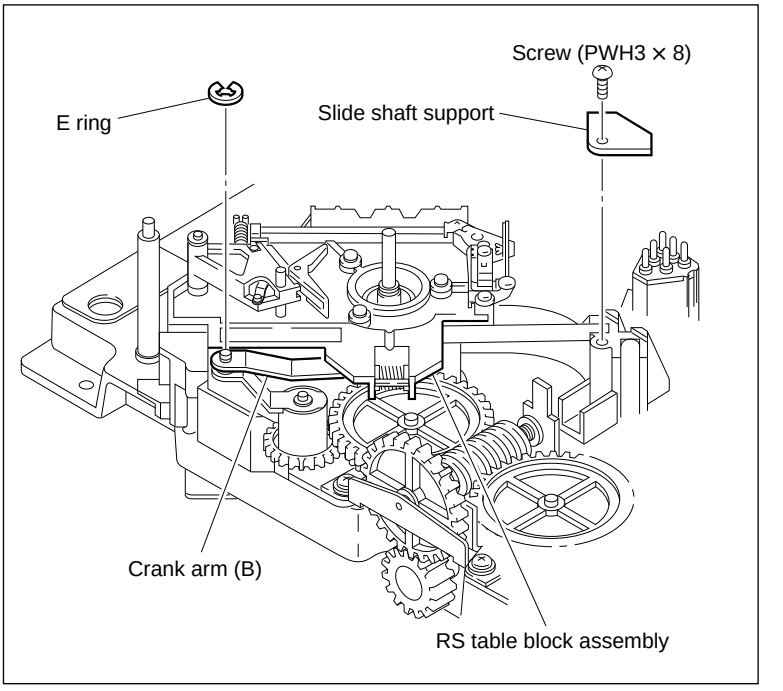
2. Crank Arm and Slide Shaft Support Removal

(1) Set the RS table block assembly to the middle between S and L cassette positions.

Note

The RS table block assembly cannot be removed in the S or L cassette position.

(2) Remove the E ring, then remove the crank arm (B).
(3) Remove the screw, then remove the slide shaft support.



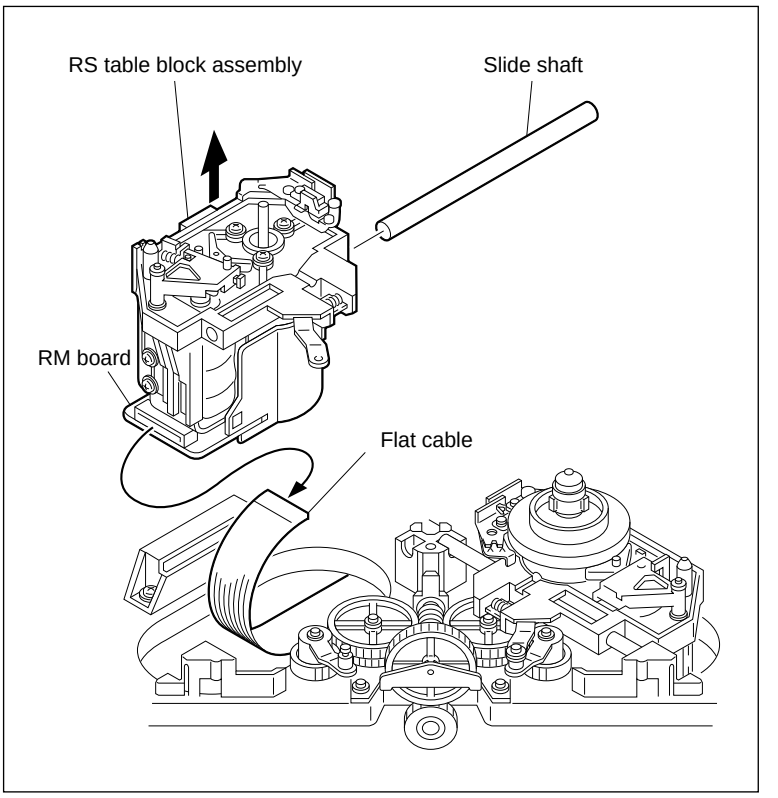
Crank Arm and Slide Shaft Support Removal

3. RS Table Block Assembly Removal

(1) Remove the RS table block assembly while pulling out the slide shaft.
(2) Disconnect the flat cable from the connector on the RM board.
(3) Wipe the grease attached on the two holes, from which the slide shaft of the RS table block assembly was pulled out, with cloth.
(4) Wipe the grease attached on the surface of the slide shaft with cloth.

Notes

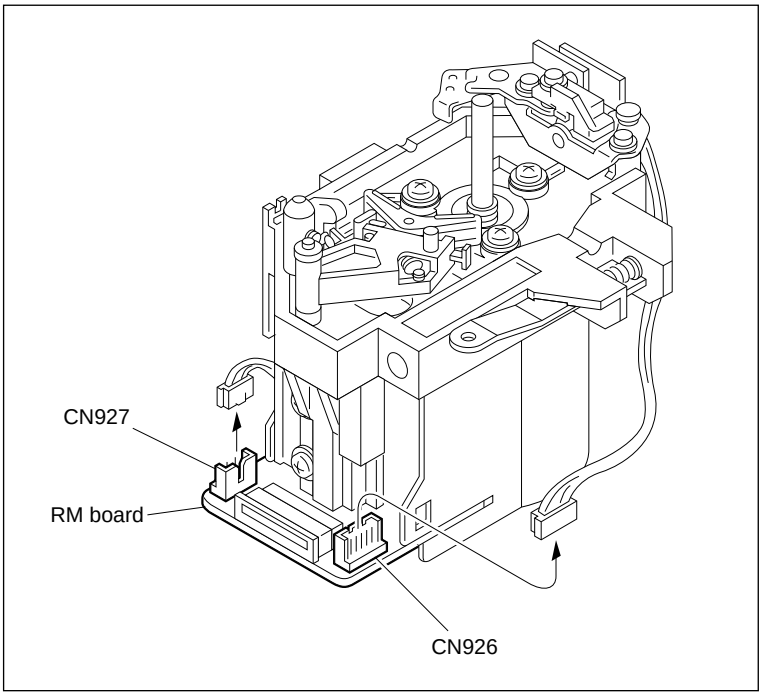
- Be careful the grease on the slide shaft does not adhere to other parts.
- Be careful not to damage the slide shaft.



RS Table Block Assembly Removal

4. Harnesses Disconnection

Disconnect the harnesses from the connectors CN926 and CN927 on the RM board.



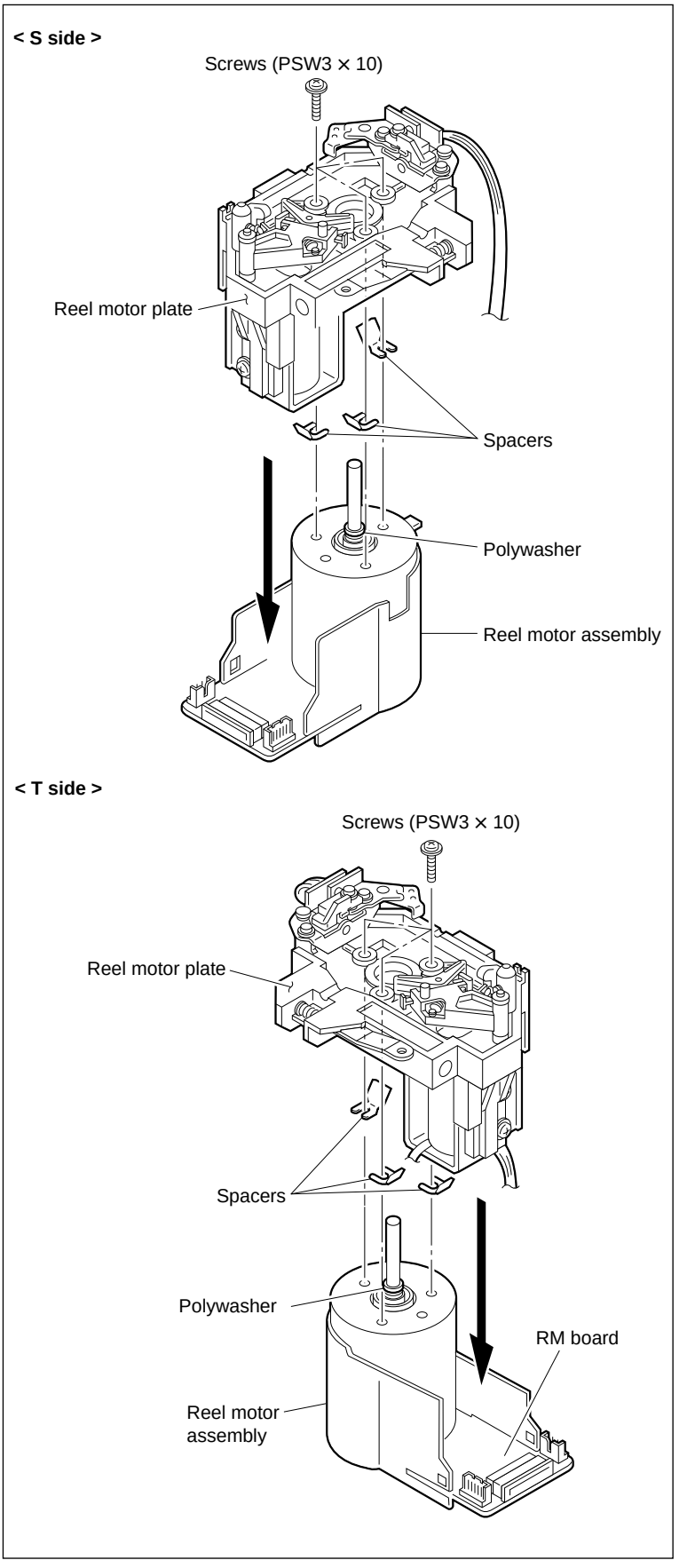
Harnesses Disconnection

5. Reel Motor Assembly Removal

Remove the three screws, then remove the reel motor assembly.

Notes

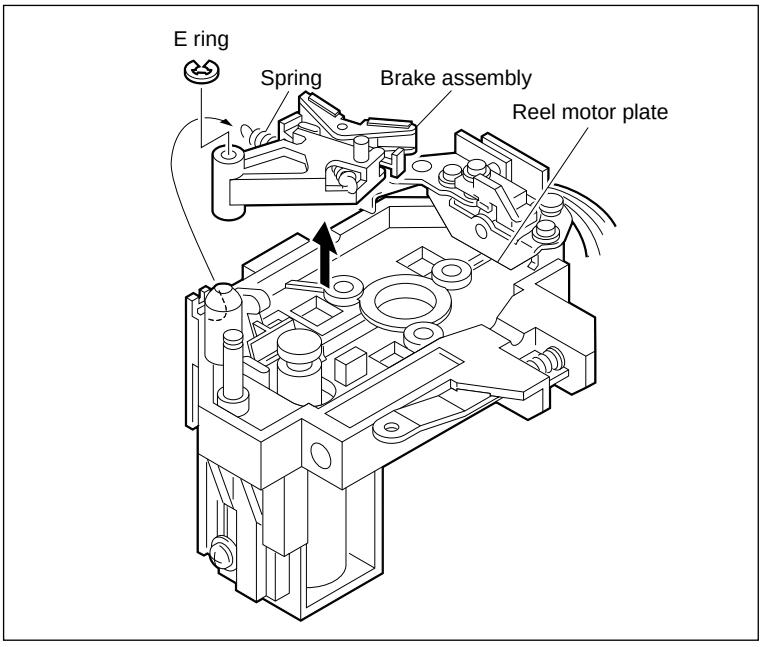
- Spacers are inserted between the reel motor and reel motor plate.
  These spacers are also removed together when the reel motor assembly is removed. Be careful not to lose them.
- Do not remove the polywasher that is passed through the reel motor shaft.



Reel Motor Assembly Removal

6. Brake Assembly Removal

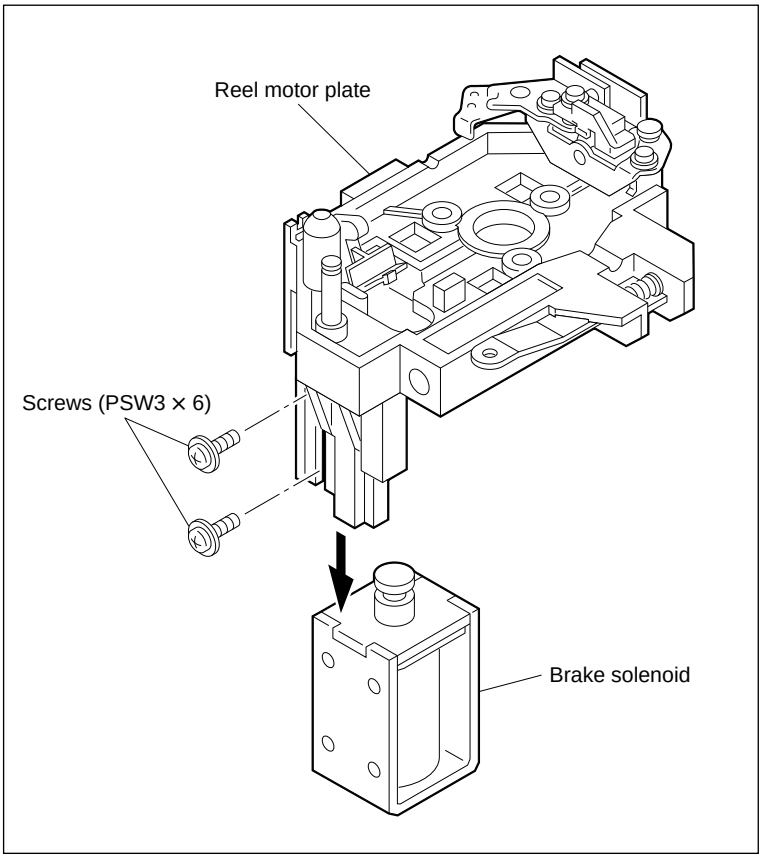
(1) Remove the spring put on the reel motor plate.
(2) Remove the E ring, then remove the brake assembly.



Brake Assembly Removal

7. Brake Solenoid Removal

Remove the two screws, then remove the brake solenoid.

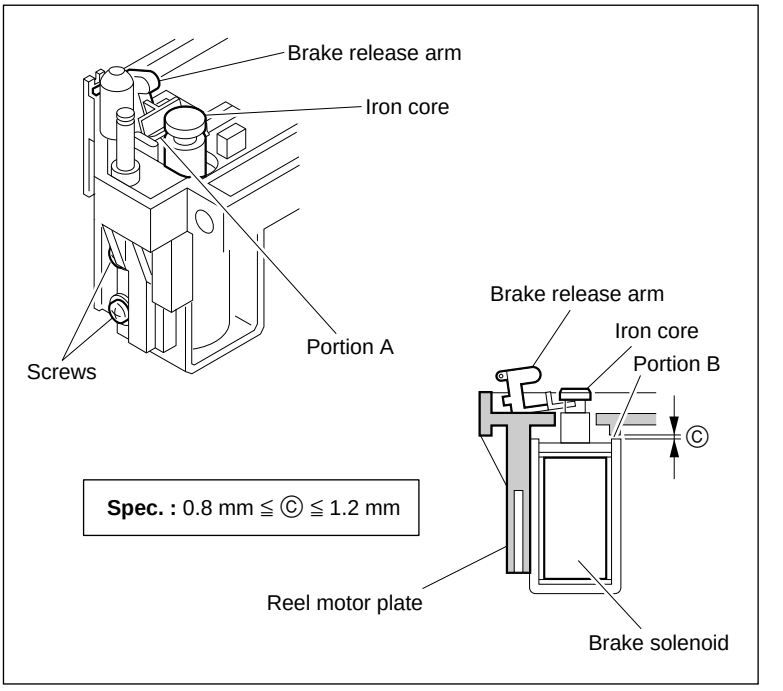


Brake Solenoid Removal

Installation

8. Brake Solenoid Installation

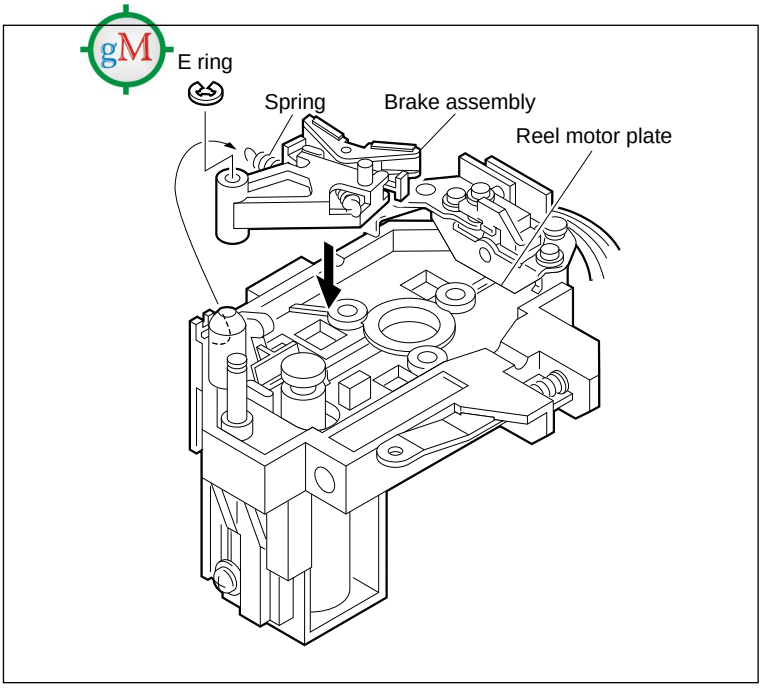
(1) Temporary attach the brake solenoid with two screws while inserting portion A of the brake release arm into the groove of the iron core.
(2) Put a thickness gauge (1.00 mm thick) between the solenoid and reel motor plate (portion B).
(3) Tighten the screws while slightly pushing the solenoid against the reel motor plate.
(4) Pull out the thickness gauge.
(5) Confirm that the clearance between the solenoid and reel motor plate satisfies the specification.



Brake Solenoid Installation

9. Brake Assembly Installation

(1) Pass the brake assembly through the shaft of the reel motor plate.
(2) Put the spring on the reel motor plate.
(3) Fix the brake assembly using an E ring.
E ring (2.3): 7-624-105-04



Brake Assembly Installation

10. Cleaning

Clean the mounting surfaces of the reel motor assembly and reel motor plate.

11. Reel Motor Assembly Installation

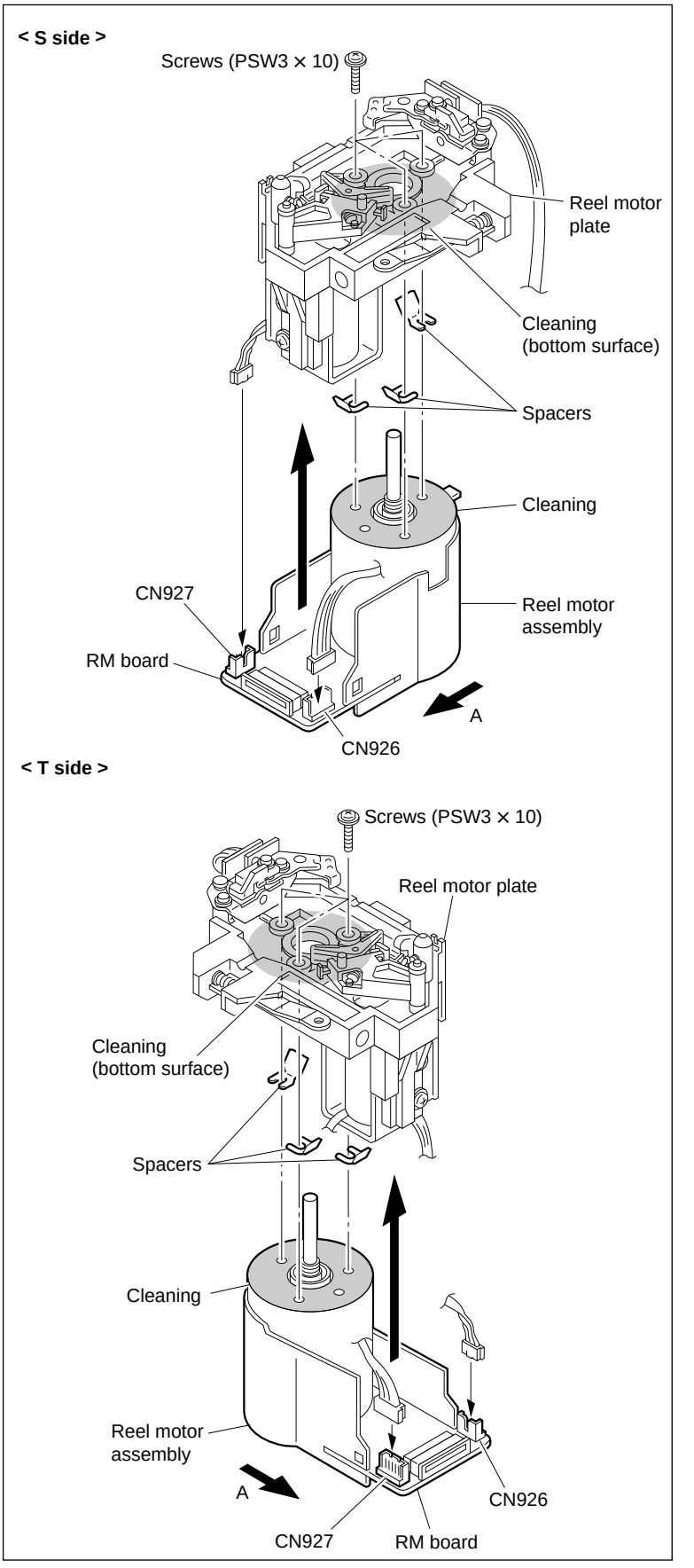
(1) Pass the reel motor assembly through the hole of the reel motor plate in the direction shown in the figure.

(2) Move the reel motor assembly in the direction indicated by arrow A and gradually tighten the three screws.

Tightening torque: 68.6×10^{-2} N • m
{7.0 kgf • cm}

12. Harnesses Connection

Connect the harnesses to CN926 and CN927 on the RM board.



Reel Motor Assembly Installation

13. Flat Cable Connection

(1) Clean the inserting portion of the flat cable using a dry cleaning cloth.
(2) Connect the flat cable disconnected in step 3 to the connector on the RM board, then lock.

Notes

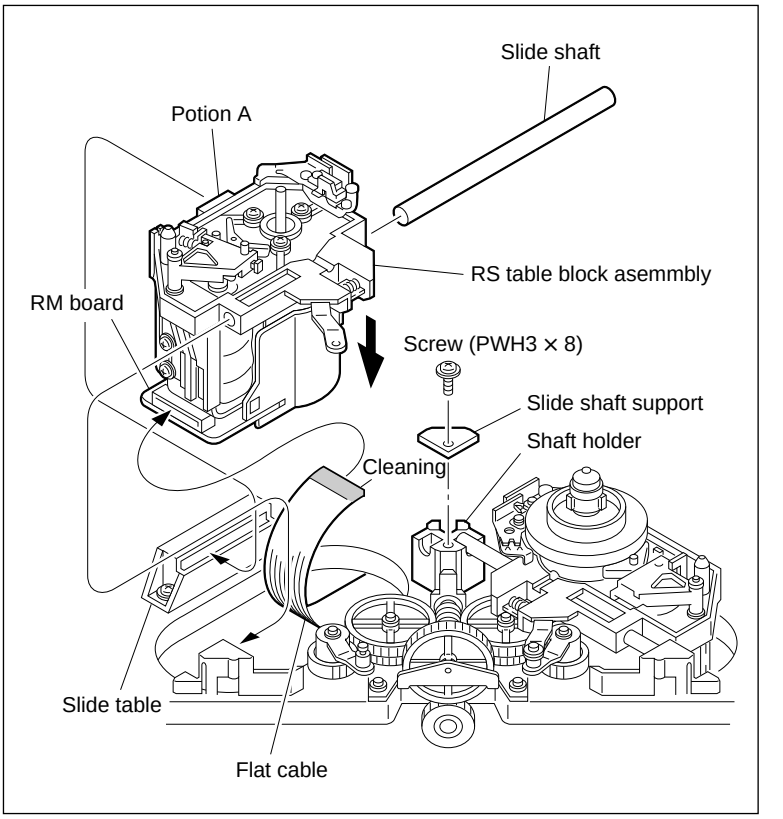
- Connect the flat cable with the conductor plating part (printing side) up.
- Be careful not to bend the flat cable when it is connected.

14. Slide Shaft Installation

Pass the slide shaft through the hole of the RS table block assembly.

15. RS Table Block Assembly Installation

(1) Put the slide shaft in the shaft holder while inserting portion A of the RS table block assembly shown in the figure into the slide table.
(2) Install the slide shaft support with the screw.



RS Table Block Assembly Installation

16. Applying Grease to Slide Shaft

(1) Slightly apply grease to the slide shaft and extend it to the whole slide shaft.

Note

Be careful that the grease dose not adhere to other parts.

(2) Confirm that the RS table block assembly moves smoothly when it is shifted to the S- and L-cassette positions.

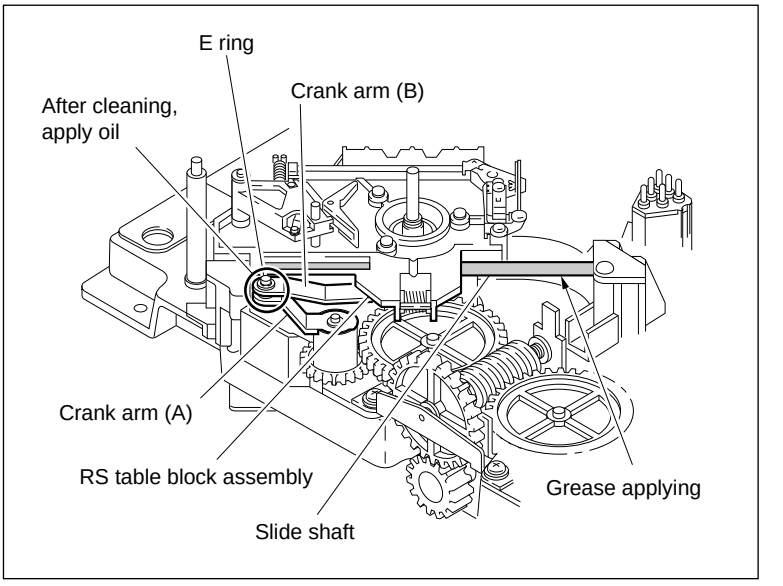
17. Crank Arm Installation

(1) Clean the shaft of the crank arm (A) and apply one drop of oil to it.
(2) Confirm that the RS table block assembly is in the middle between S and L cassette positions.

Note

Attach the crank arm in the middle between S and L cassette positions for the adjustment of gear phase.

(3) Attach the crank arm (B) in the shaft of the crank arm (A) with the E ring.



Applying Grease to Slide Shaft/Crank Arm Installation

Adjustment after Replacement

18. Reel Motor Shaft Slantness Confirmation

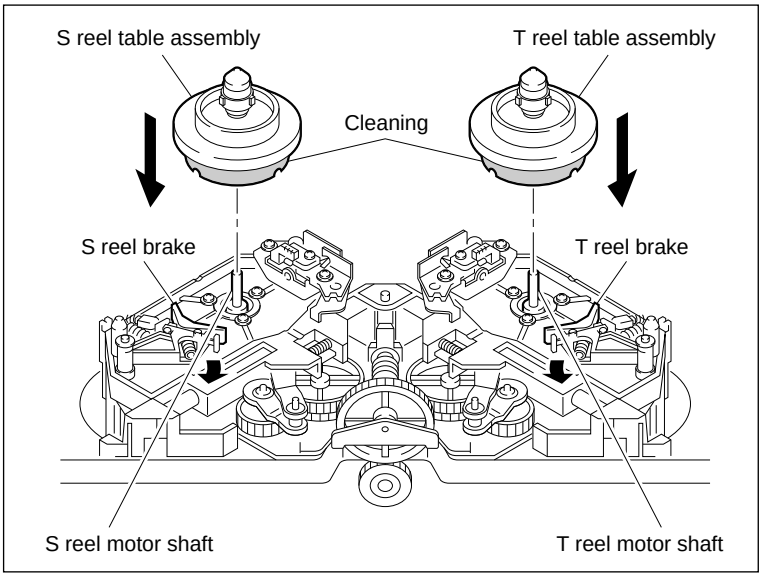
Refer to Section 5-9-2.

19. Reel Table Assembly Installation

(1) Clean the circumference of the reel table assembly.
(2) While moving the reel brake in the direction indicated by the arrow to make free, pass the reel table assembly through the reel motor shaft.

Note

Tighten the two set screws of the reel table assembly after reel table height confirmation is complated.



Reel Table Assembly Installation

20. Cassette Pillar Height Confirmation

Refer to Section 5-9-3.

21. Reel Table Height Confirmation

Refer to Section 5-9-4.

22. Reel Brake Clearance Confirmation

Refer to Section 5-9-5.

23. Reel Brake Release Confirmation

Refer to Section 5-9-6.

24. Brake Solenoid Operation Confirmation

Refer to Section 4-2-2 in Maintenance Manual Part 1.
(C021: S REEL BRAKE,
C022: T REEL BRAKE)

5-16. S Tention Regulator Assembry Replacement

Outline

Replacement

1. Put the Unit into the Unthreading End State
2. S Tension Regulator Assembly Removal
3. S Tension Regulator Assembly Installation

Adjustment after Replacement

4. Tape Running Adjustment (Refer to Section 7-1-2.)
5. Tension Offset Adjustment
   (Refer to Section 4-2-7 in Maintenance Manual Part 1.)
   (A008: S/T TENSION OFFSET)

Note

The replacement of the component part on the S tension regulator assembly requires a precise adjustment. Therefore, replace the whole assembly (A-8267-795-E).

Preparation

1. Turn off the power.
2. Remove the upper lid. (Refer to Section 2-3-1 in Maintenance Manual Part 1.)
3. Remove the plate MD assembly. (Refer to Section 2-4 in Maintenance Manual Part 1.)
4. Remove the cassette compartment assembly. (Refer to Section 2-5 in Maintenance Manual Part 1.)

Tools

- Cleaning cloth: 3-184-527-01
- Cleaning fluid: 9-919-573-01

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Removal

1. Put the Unit into the Unthreading End State

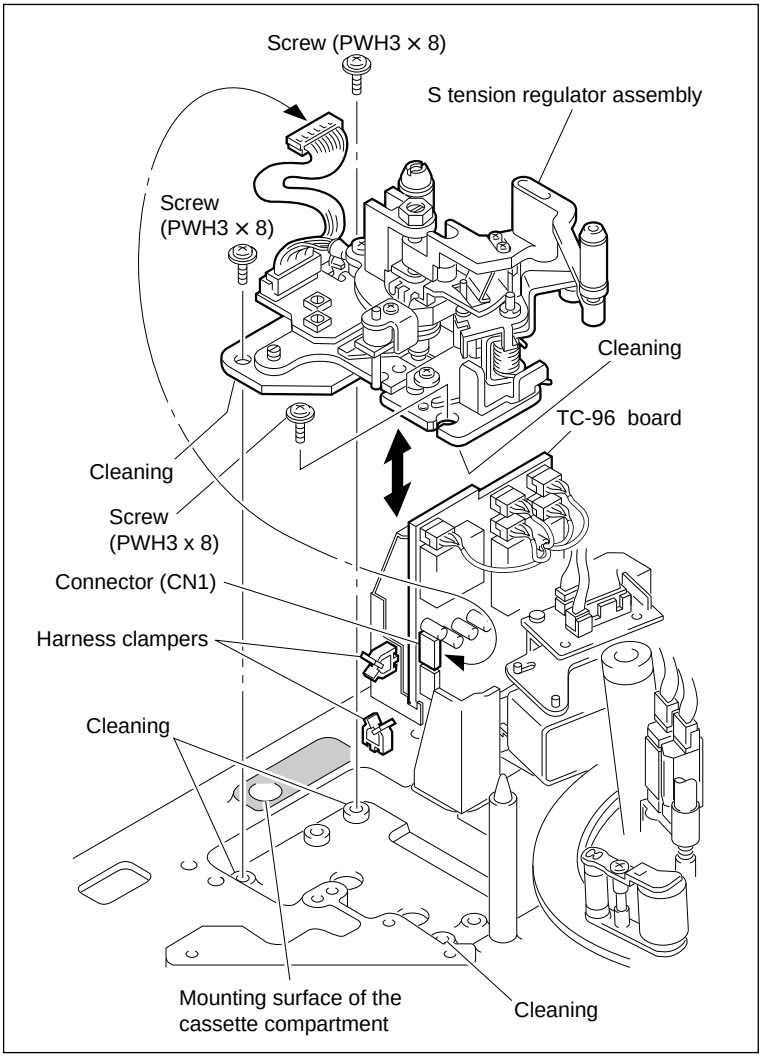
2. S Tension Regulator Assembly Removal

(1) Disconnect the harness from the connector CN1 on the TC-96 board.
(2) Remove the three screws, then remove the S tension regulator assembly.

Installation

3. S Tension Regulator Assembly Installation

(1) Clean the mounting surfaces of the S tension regulator assembly and chassis in three portions.
(2) Set the S tension regulator assembly and tighten the three screws.
(3) Connect the harness to CN1 on the TC-96 board.
(4) Put the harness in the harness clamper.
(5) Confirm that the harness does not protrude into the mounting surface (portion in the figure) of the cassette compartment.



S Tension Regulator Assembly Removal/Installation

Adjustment after Replacement

4. Tape Running Adjustment

Refer to Section 7-1-2.

5. Tension Offset Adjustment

Refer to Section 4-2-7 in Maintenance Manual Part 1.
(A008: S/T TENSION OFFSET)

5-17. T Tention Arm Replacement

Outline

Replacement

1. Tension Spring Removal (on the T Tension Base Side)
2. T Tension Arm Removal
3. Yoke Plate Removal
4. Yoke Plate Installation
5. T Tension Arm Installation
6. Tension Spring Installation (on the T Tension Base Side)
7. T Tension Regulator Operation Confirmation

Adjustment after Replacement

8. Tension Offset Adjustment
   (Refer to Section 4-2-7 in Maintenance Manual Part 1.)
   (A008: S/T TENSION OFFSET)

Notes

- This section explains the replacement procedures of the T tension arm.
  When replacing whole of the T tension assembly, refer to the exploded views.
  The T tension assembly supplied as repair parts differs in the harness length from one used in this unit because of standardization of repair parts. When replacing the T tension assembly, replace the harness by one used in this unit.
- Use a new stop washer when the T tension arm is replaced.
  Stop washer (2.3): 3-669-596-00

Preparation

1. Put the unit into the unthreading end state.
2. Turn off the power.
3. Remove the upper lid. (Refer to Section 2-3-1 in Maintenance Manual Part 1.)
4. Remove the plate MD assembly. (Refer to Section 2-4 in Maintenance Manual Part 1.)
5. Remove the cassette compartment assembly. (Refer to Section 2-5 in Maintenance Manual Part 1.)

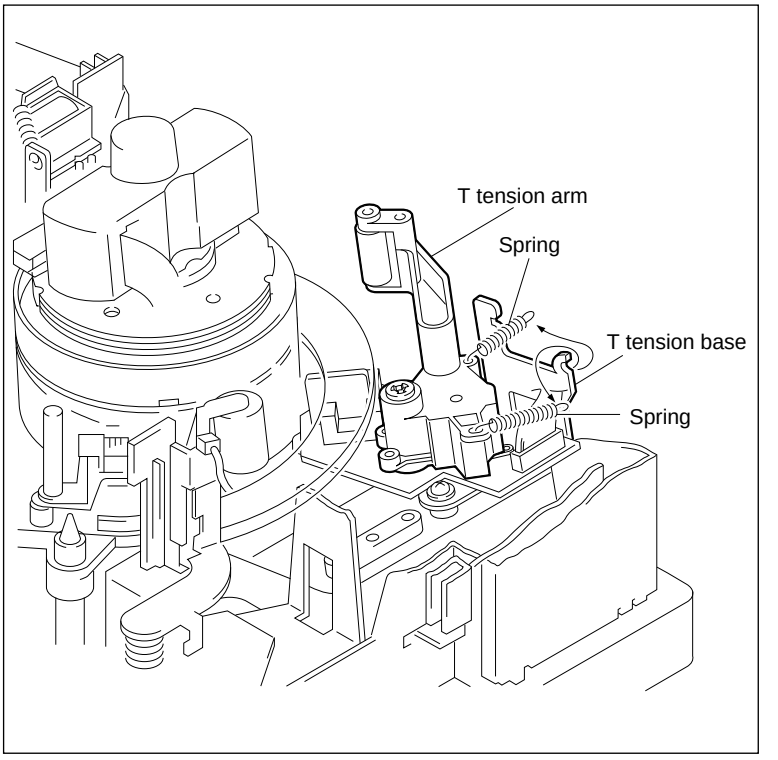
Tools

- Locking compound: 7-432-114-11
- Cleaning fluid: 9-919-573-01
- Cleaning cloth: 3-184-527-01

Removal

1. Tension Spring Removal

Remove the two springs caught on the T tension base.



Tension Spring Removal

2. T Tension Arm Removal

(1) Remove the stop washer, then remove the T tension arm.

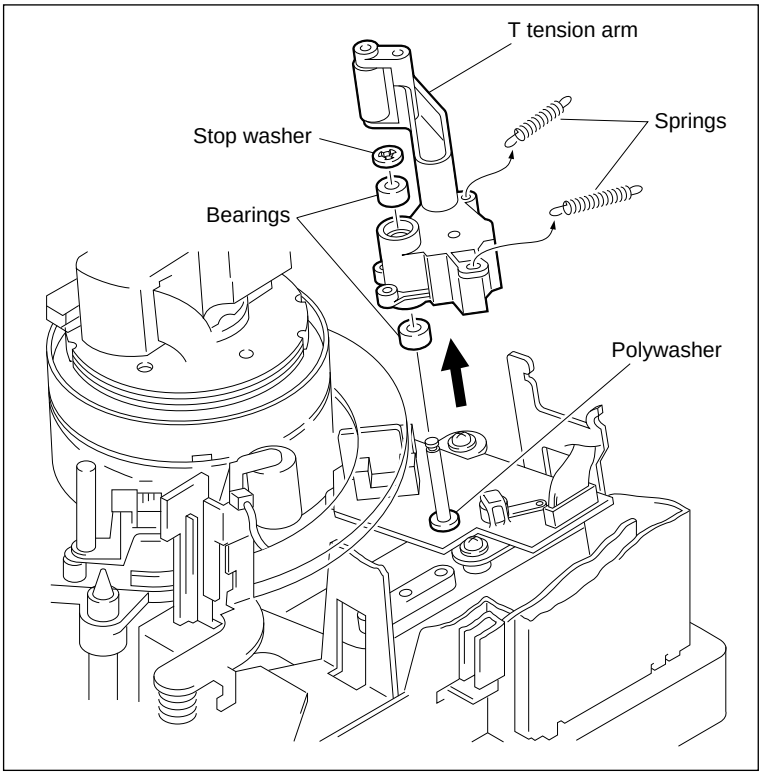
Notes

- Do not reuse the stop washer.
- A polywasher may be attached together when the T tension arm is removed. In this case, remove the polywasher from the T tension arm and return it to the shaft.

(2) Remove the two bearings and two springs from the T tension arm.

Note

The two springs are the same.



T Tension Arm Removal

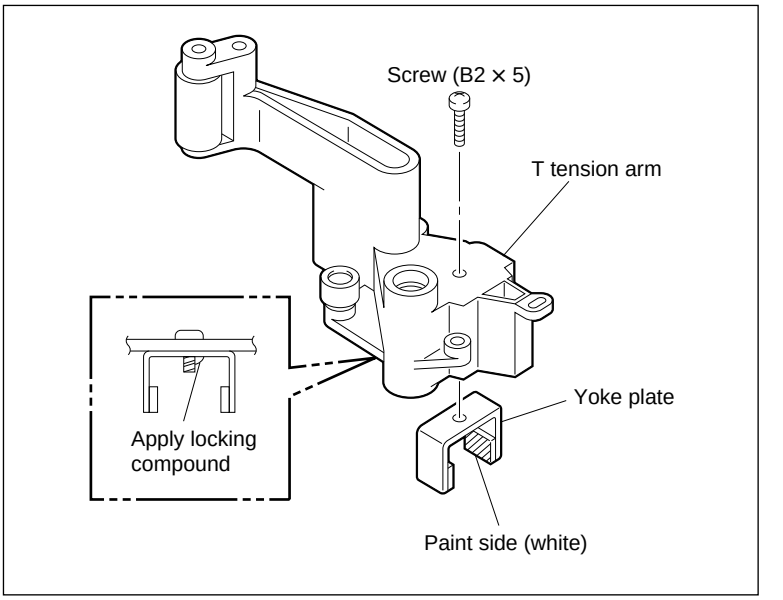
3. Yoke Plate Removal

Remove the screw, then remove the yoke plate from the T tension arm.

Installation

4. Yoke Plate Installation

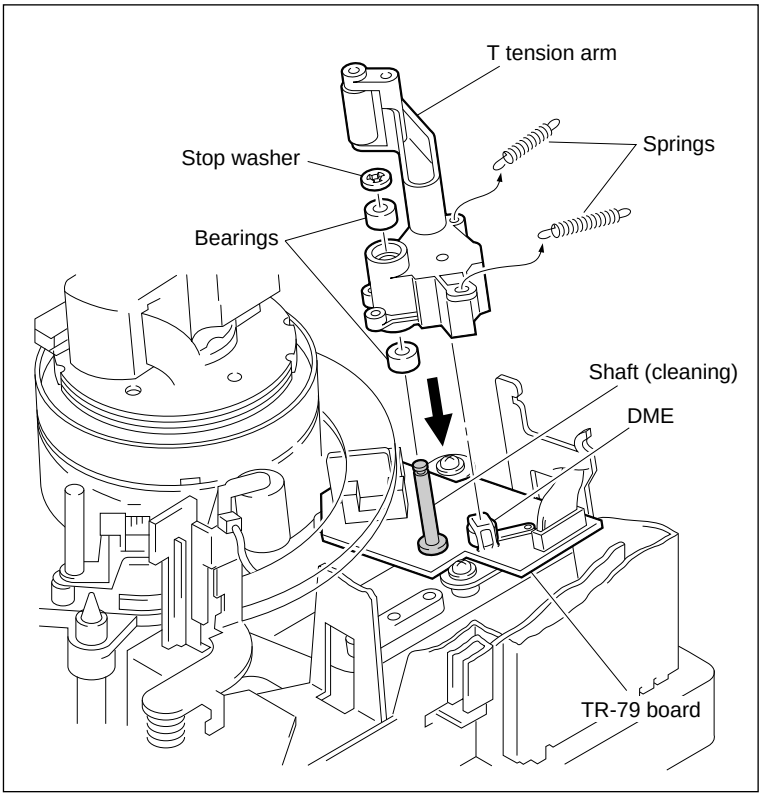
(1) Put the yoke plate in the direction shown in the figure and tighten the screw.
(2) Slightly apply locking compound to the yoke plate.



Yoke Plate Removal/Installation

5. T Tension Arm Installation

(1) Clean the shaft.
(2) Insert the two bearings into the T tension arm.
(3) Put the two springs on the T tension arm as shown in the figure.
(4) Pass the T tension arm through the shaft while putting DME on the TR-79 board in the T tension arm.
(5) Fix the T tension arm using a new stop washer.



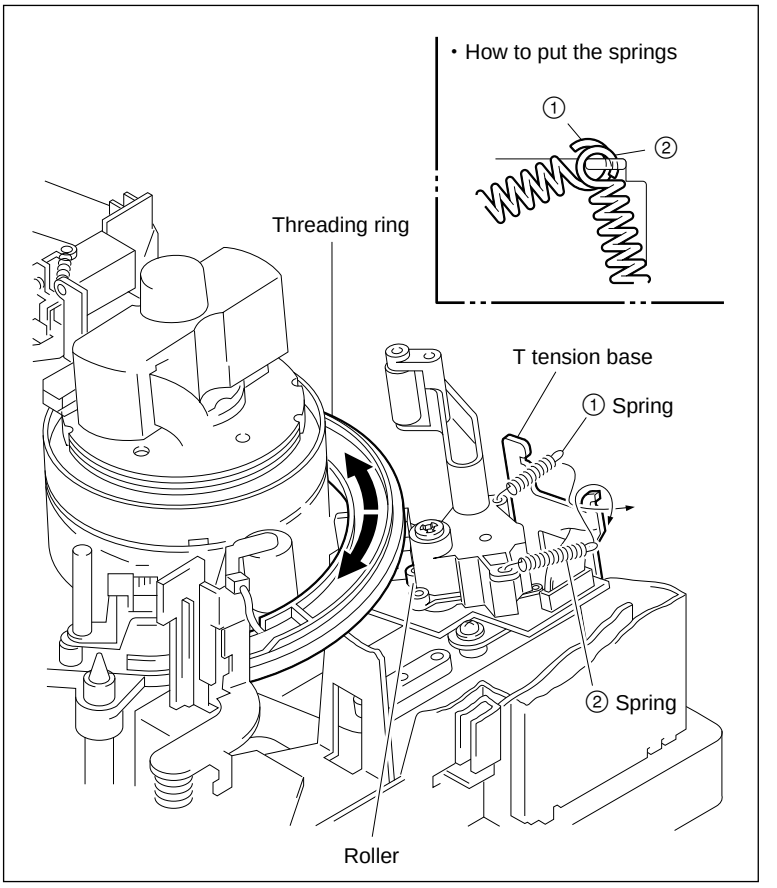
T Tension Arm Installation

6. Tension Spring Installation

Put the two springs removed in (2) of step 2 on the T tension base in the order of ① and ② in the direction shown in the figure.

7. T Tension Regulator Operation Confirmation

Put the threading ring into the threading/ unthreading state and confirm that the T tension regulator roller is not dislocated from the threading ring and operates normally.



Tension Spring Installation

Adjustment after Replacement

8. Tension Offset Adjustment

Refer to Section 4-2-7 in Maintenance Manual Part 1.
(A008: S/T TENSION OFFSET)

5-18. T Drawer Arm Replacement

5-18-1. T Drawer Arm Replacement

Outline

Replacement

1. T Drawer Assembly Removal
2. T Drawer Arm Removal
3. Slant Guide Removal
4. Slant Guide Base Removal
5. Drawer Guard Removal
6. Drawer Guard Installation
7. Slant Guide Base Installation
8. Slant Guide Installation
9. T Drawer Arm Installation
10. T Drawer Assembly Installation
11. T Drawer Assembly Operation Confirmation

Adjustment after Replacement

12. Slant Guide Slantness Adjustment (Refer to Section 5-18-2.)

Notes

- The slant guide, slant guide base, and drawer guard can be replaced in the same procedure as described in this section.
- Use a new stop washer when the T drawer arm is replaced.
  Stop washer (2.3): 3-669-596-00

Preparation

1. Put the unit into the unthreading end state.
2. Turn off the power.
3. Remove the upper lid. (Refer to Section 2-3-1 in Maintenance Manual Part 1.)
4. Remove the plate MD assembly. (Refer to Section 2-4 in Maintenance Manual Part 1.)
5. Remove the cassette compartment assembly. (Refer to Section 2-5 in Maintenance Manual Part 1.)

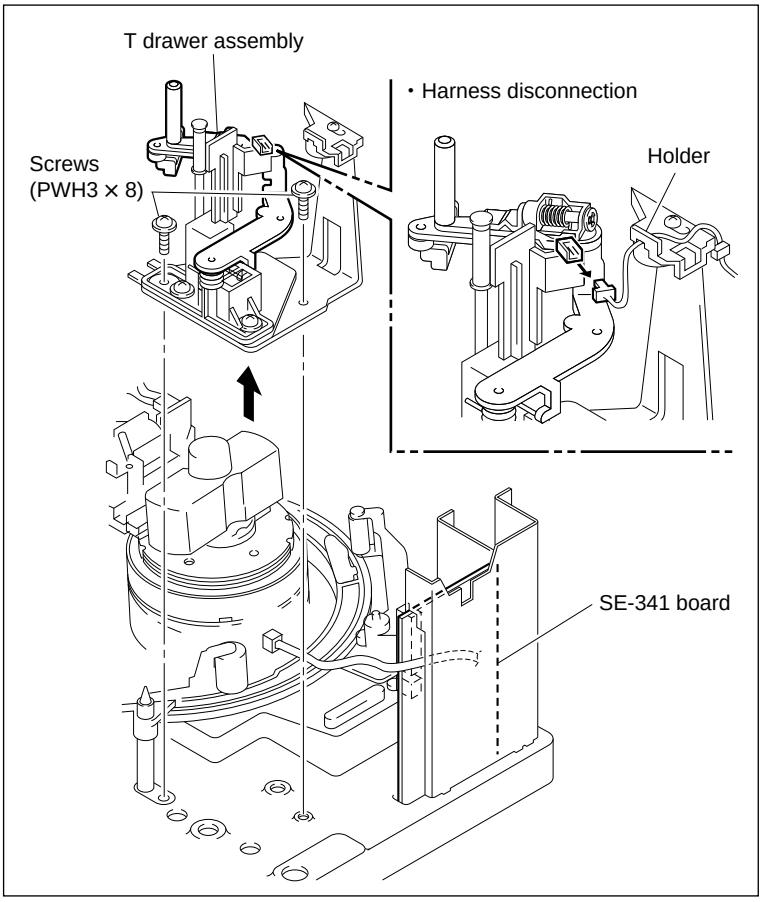
Tools

- Locking compound: 7-432-114-11
- Cleaning fluid: 9-919-573-01
- Cleaning cloth: 3-184-527-01
- Calipers (or the equivalent)

Removal

1. T Drawer Assembly Removal

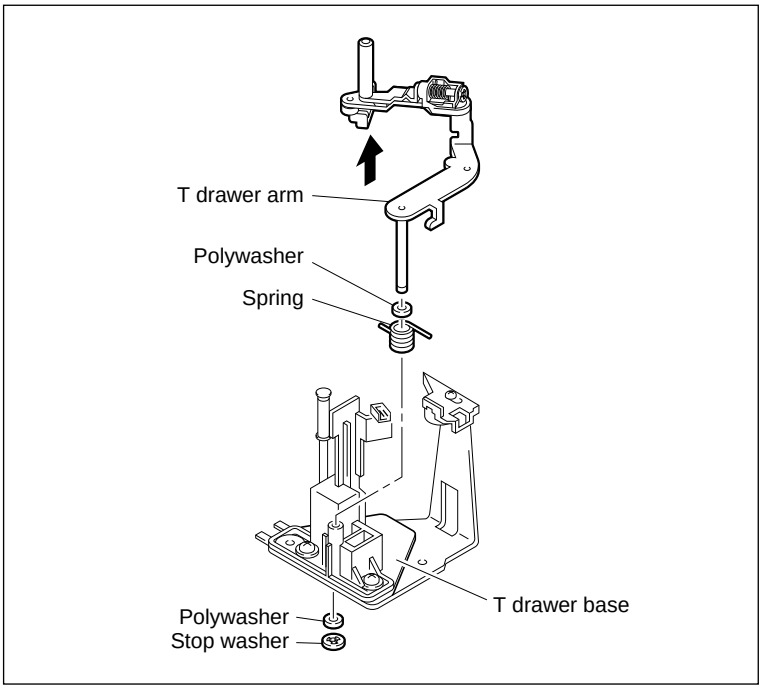
(1) Disconnect the harness from the connector of the tape top sensor.
(2) Remove the harness from the holder of the adjustment plate.
(3) Remove the two screws, then remove the T drawer assembly.



T Drawer Assembly Removal

2. T Drawer Arm Removal

(1) Remove the stop washer and polywasher, then remove the T drawer arm from the T drawer base.
(2) Remove the spring and polywasher.



T Drawer Arm Removal

3. Slant Guide Removal
Remove the stop washer, then remove the slant guide and spring from the T drawer arm.

4. Slant Guide Base Removal
Remove the screw, then remove the slant guide base from the T drawer arm.

5. Drawer Guard removal
Remove the screw, then remove the drawer guard from the T drawer arm.

Installation

6. Drawer Guard Installation
(1) While pushing the drawer guard in the direction indicated by the arrow, tighten the screw.
(2) Apply locking compound to the screw.

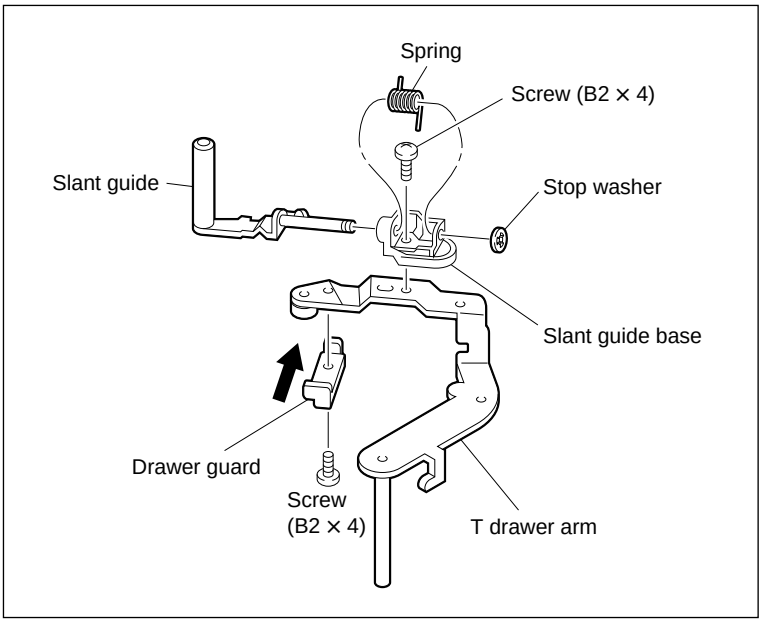
7. Slant Guide Base Installation
(1) Move the slant guide base counterclockwise and tighten the screw.
(2) Apply locking compound to the screw.

8. Slant Guide Installation
(1) Pass the spring through the Slant guide base while passing it through the slant guide shaft.
(2) Put the spring on the slant guide base.
(3) Fix the slant guide with a new stop washer.

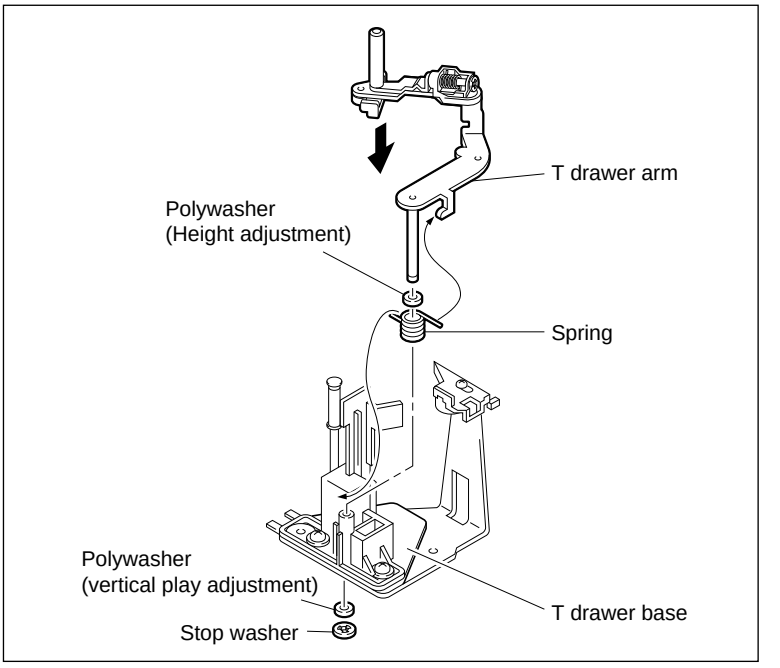
9. T Drawer Arm Installation
(1) Pass the polywasher and spring through the T drawer base while passing them through the shaft of the T drawer arm assembly.
(2) Put the spring on the T drawer arm and T drawer base.
(3) Confirm that specification 1 is satisfied with the T drawer arm pushed downward.

If specification 1 is not satisfied, perform the following adjustment. (Height adjustment)
① Remove the T drawer arm and spring.
② Adjust the polywasher value at the top of the T drawer base.
③ Confirm that specification 1 is satisfied.

(4) Pass the polywasher through the shaft and fix the T drawer arm using a new stop washer.



T Drawer Arm Disassemble/Assemble



(5) Move the T drawer arm manually in the vertical direction. At that time, confirm that the vertical play satisfies specification 2.

If specification 2 is not satisfied, perform the following adjustment. (Vertical play adjustment)

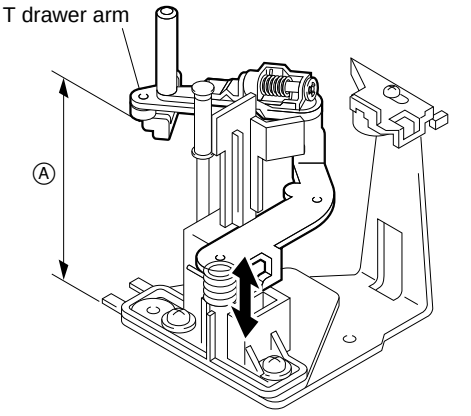
① Remove the stop washer.
② Adjust the polywasher value at the bottom of the T drawer base.
③ Fix the T drawer arm using a new stop washer and confirm that specification 2 is satisfied.

(6) Confirm that the height of the T drawer arm satisfies the specification 3 with the T drawer arm turned to clockwise by finger.
If specification 3 is not satisfied, perform the steps (3) and later again.

Note

Some of the T drawer assemblies have no arm stopper. In these cases, the confirmation described above, step 6, is not required.

・T drawer arm height adjustment/vertical play adjustment



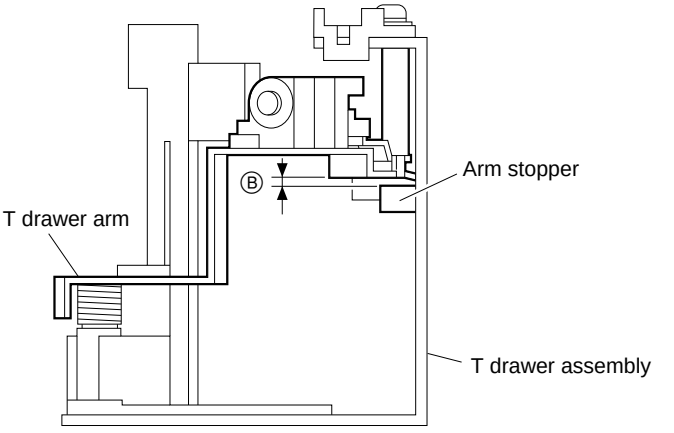
Spec. 1: (height)
Ⓐ = 36.3 mm to 36.7 mm
Spec. 2: (vertical play)
0.2 mm or less

・Spec. 1 and 2 are not satisfied.

・Polywasher to adjustment

diameter	thickness	Part No.
3.0 mm	0.13 mm	3-701-439-01
	0.25 mm	3-701-439-11
	0.5 mm	3-701-439-21

< Side view >

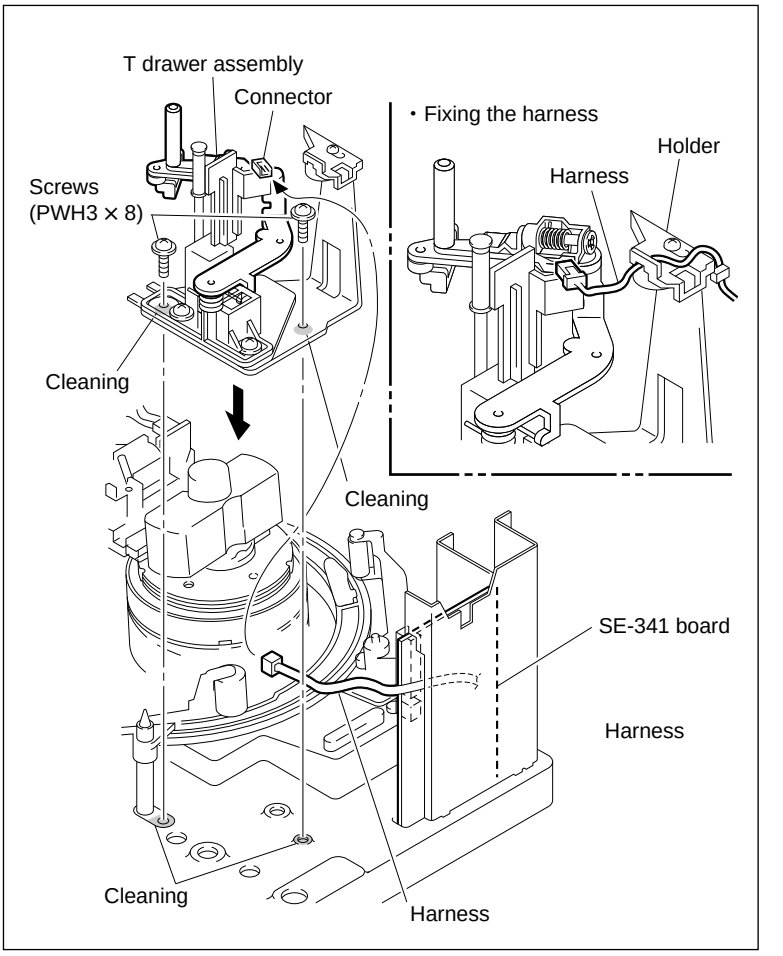


Spec.3 : Ⓑ ≧ 0.2 mm
(Between arm stopper and arm)

T Drawer Arm Installation

10. T Drawer Assembly Installation

(1) Clean the mounting surfaces of the T drawer assembly and chassis.
(2) Set the T drawer assembly and tighten the two screws.
(3) Connect the harness to the connector of the tape top sensor.
(4) Fix the harness to the holder of the adjustment plate.



T Drawer Assembly Installation

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11. T Drawer Assembly Operation Confirmation

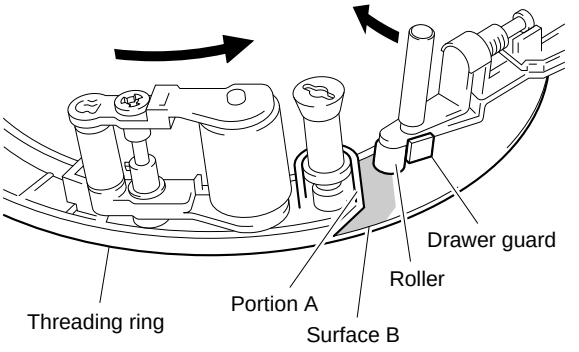
(1) Confirm that portion A of the threading ring is securely pushing the roller and drawer guard of the T drawer assembly during threading. Moreover, confirm that the lower surface of the roller does not touch with the surface B (portion in the figure) of the threading ring at that time. (Specification 4)

If specification 4 is not satisfied, adjust the height and vertical play of the T drawer arm. (Refer to step 9.)

(2) Confirm that the roller of the T drawer assembly smoothly moves along the inside of the threading ring during unthreading. Moreover, confirm that the lower surface of the roller does not touch with the surface B (portion in the figure) of the threading ring at that time. (Specification 5)

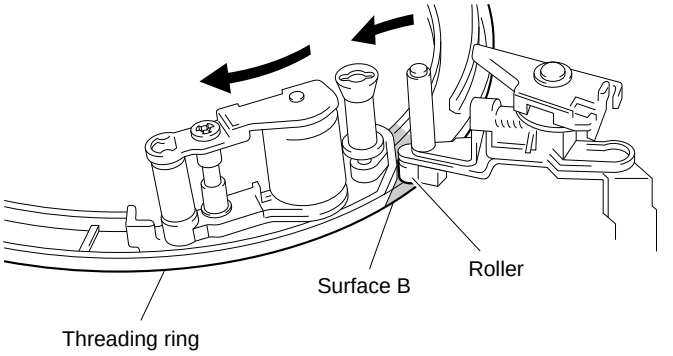
If specification 5 is not satisfied, adjust the height and vertical play of the T drawer arm. (Refer to step 9.)

・Threading



Spec. 4 : At the threading state, the lower surface of the roller does not touch with the surface B of the threading ring.

・Untherading



Spec. 5 : At the unthreading state, the lower surface of the roller does not touch with the surface B of the threading ring.

T Drawer Assembly Operation Confirmation

Adjustment after Replacement

12. Slant Guide Slantness Adjustment

Refer to Section 5-18-2.

5-18-2. Slant Guide Slantness Adjustment

Note

Be sure to perform this adjustment when the T drawer arm and slant guide are replaced.

Tools

- Cassette reference plate (L)(MW-088): J-6320-880-A
- Tension regulator slantness check tool (BW-080): J-6190-800-A
- Thickness gauge: 9-911-053-00
- Cleaning cloth: 3-184-527-01
- Cleaning fluid: 9-919-573-01
- Locking compound: 7-432-114-11
- Metal cassette tape for Betacam SP (L cassette)

Confirmation

1. Cassette Reference Plate (L) Installation

Put the cassette reference plate (L) in the direction shown in the figure and align it with the two cassette posts.

2. Slant Guide Slantness Confirmation

(1) Press the check tool against the slant guide from the directions indicated by arrows A and B.
(2) Confirm that the clearance between the slant guide and tool satisfies specifications 1 and 2.

If specifications 1 and 2 are not satisfied, repeat steps (3) and (4) below until they are satisfied.

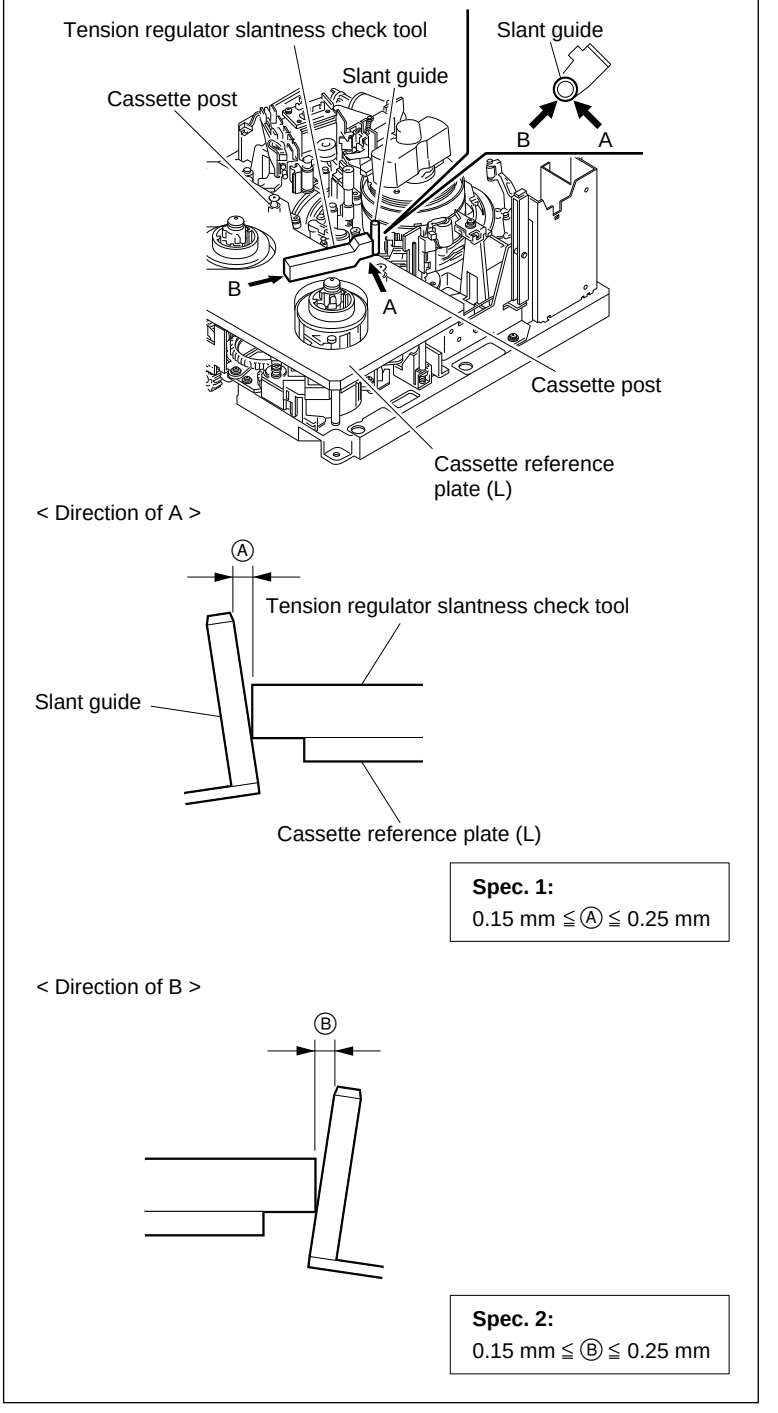
(3) Bend the slant guide so that specifications 1 and 2 are satisfied.
(4) Repeat the threading/unthreading and reconfirm that specifications 1 and 2 are satisfied.

3. Cassette Reference Plate (L) Removal

Remove the tension regulator slantness check tool and cassette reference plate (L).

4. Cleaning

Clean the slant guide using a cleaning cloth moistened with cleaning fluid.



Slant Guide Slantness Confirmation

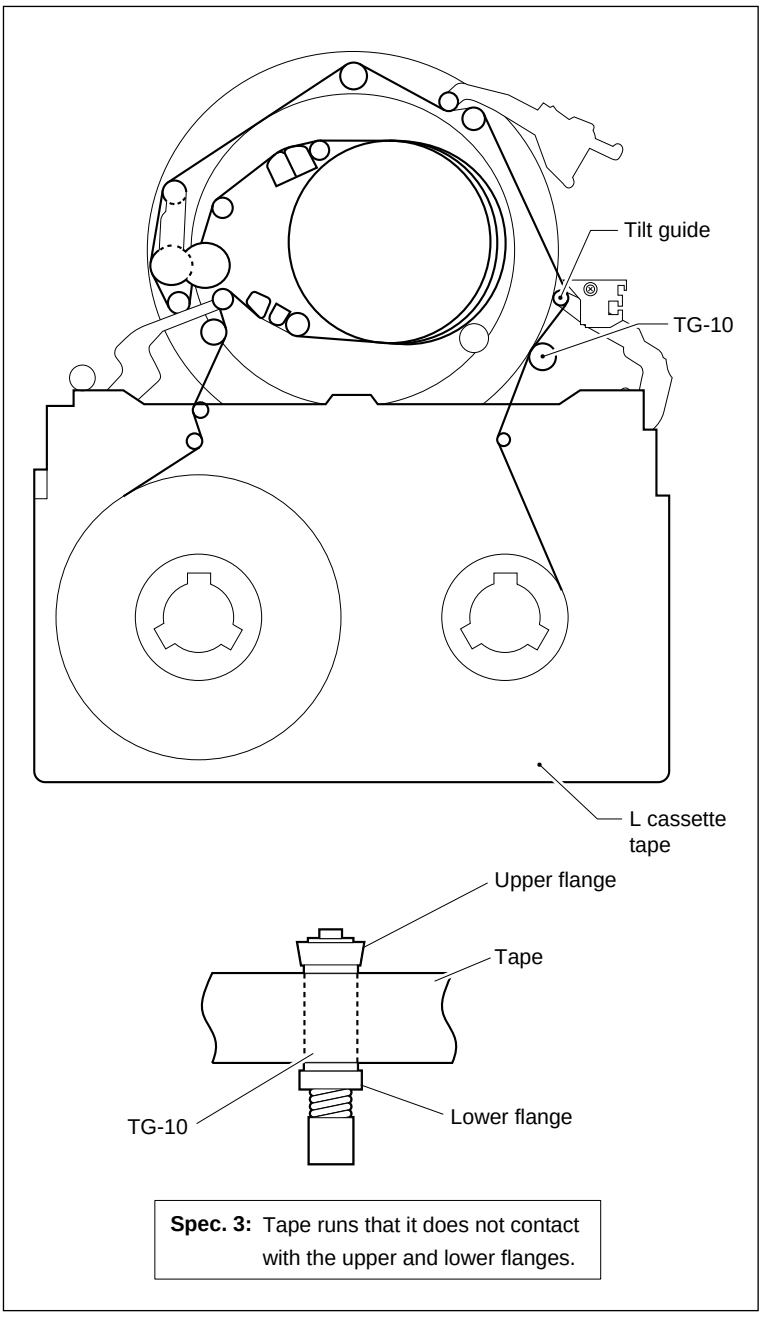
5. Set the L Cassette Tape

(1) Put the RS table block assembly into the L cassette position.
(2) Set the L cassette tape and put a weight so that the cassette is stable.
Weight about 1,000 g is suitable.

6. Tape Running Confirmation at TG-10 Guide

(1) Put the unit into the F.FWD mode, then put it into the PLAY mode after approximately three seconds.
(2) Confirm that the tape runs at the TG-10 guide with specification 3 is satisfied state.

If specification 3 is not satisfied, perform the adjustments in steps 7 and later.



Tape Running Confirmation at TG-10 Guide

Adjustment

7. Loosen the Screw

Loosen the fixing screw of the adjustment plate by 1/4 to 1/2 turn.

8. Slant Guide Slantness Adjustment

(1) Insert a 3 mm flatbladed screwdriver into the notch of the adjustment plate.
(2) Adjust the position of the adjustment plate so that specification 3 is satisfied.

- When the tape touches with the upper flange: Move the adjustment plate in the direction indicated by arrow A.
- When the tape touches with the lower flange: Move the adjustment plate in the direction indicated by arrow B.

9. Tighten the Screw

Tighten the screw loosened in step 7.

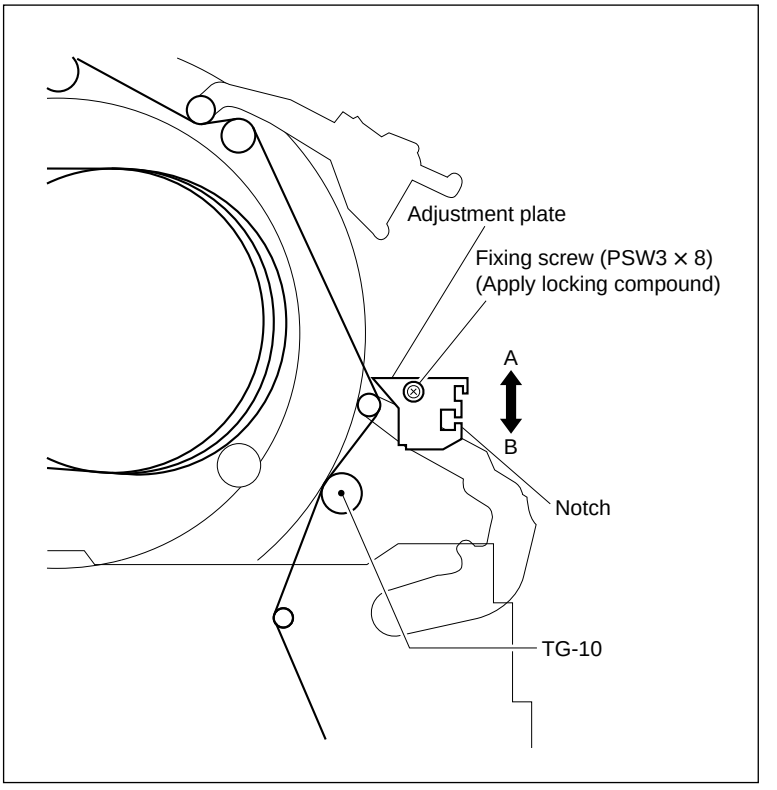
10. Tape Running Reconfirmation at TG-10 Guide

(1) Put the unit into the unthreading end mode.
(2) Put the unit into the PLAY mode again, and reconfirm that the tape runs at the TG-10 guide with specification 3 is satisfied state.

If specification 3 is not satisfied, repeat steps 7 through 10.

11. Apply Locking Compound

Apply the locking compound to the fixing screw of the adjustment plate.



Slant Guide Slantness Adjustment

5-19. Gear Box Assembly and Threading Motor Replacement

Outline

Replacement

1. Bottom Plate Removal
2. Hard Disk Drive Unit Removal
3. DR-315 Board Removal
4. Harness Disconnection
5. Gear Box Assembly Removal
6. Threading Motor Removal
7. CCM-15 Board Removal
8. CCM-15 Board Mounting
9. Threading Motor Installation
10. Gear Box Assembly Installation
11. Harness Connection
12. DR-315 Board Mounting
13. Hard Disk Drive Unit Installation
14. Bottom Plate Installation

Adjustment after Replacement

15. Threading Motor Operation Confirmation (Refer to Section 4-2-2 in Maintenance Manual Part 1.)
    (C012: THREADING MOTOR)

Notes

- The gear box assembly supplied as repair parts may differ in two harness length from one used in this unit because of standardization of repair parts. When replacing the gear box assembly, replace the two harness by ones used in this unit according to the procedure described in this section.
- The threading motor, CCM-15 board, and gear box assembly can be replaced according to the procedure described in this section. Perform all the procedures when the threading motor or CCM-15 board is replaced. Perform the steps 1 through 5 and 10 through 15 when the gear box assembly is replaced.

Preparation

1. Turn off the power.
2. Remove the upper lid. (Refer to Section 2-3-1 in Maintenance Manual Part 1.)
3. Remove the plate MD assembly. (Refer to Section 2-4 in Maintenance Manual Part 1.)
4. Remove the cassette compartment assemby. (Refer to Section 2-5 in Maintenance Manual Part 1.)

Tools

- L wrench (Across flat has 1.27 mm): 7-700-736-01
- Locking compound: 7-432-114-11
- Thickness gauge: 9-911-053-00

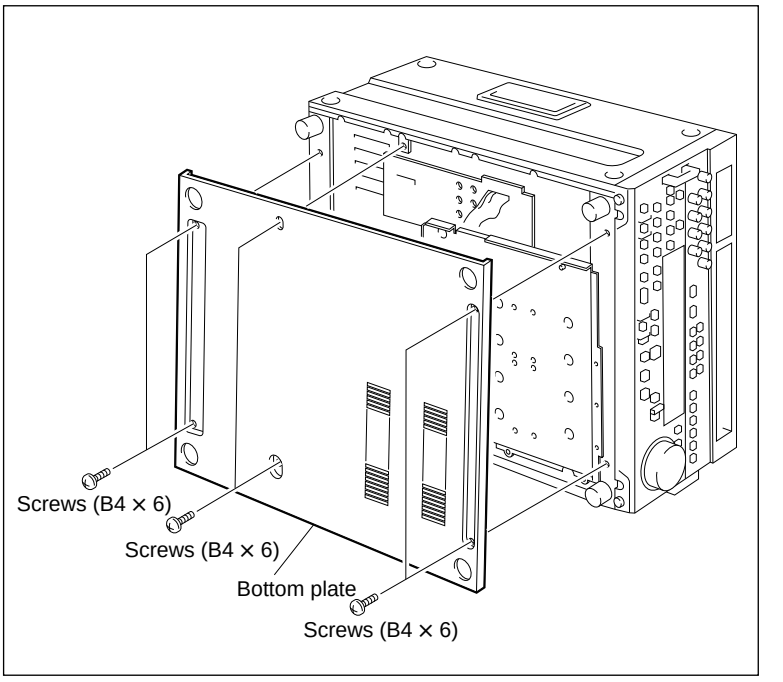
Removal

1. Remove the Bottom Plate

(1) Place the unit on its right side panel down.
(2) Remove the six screws and remove the bottom plate.

2. Remove the Hard Disk Drive Unit

Remove the hard disk drive unit.
(Refer to Section 5-31-2.)



Remove the Bottom Plate

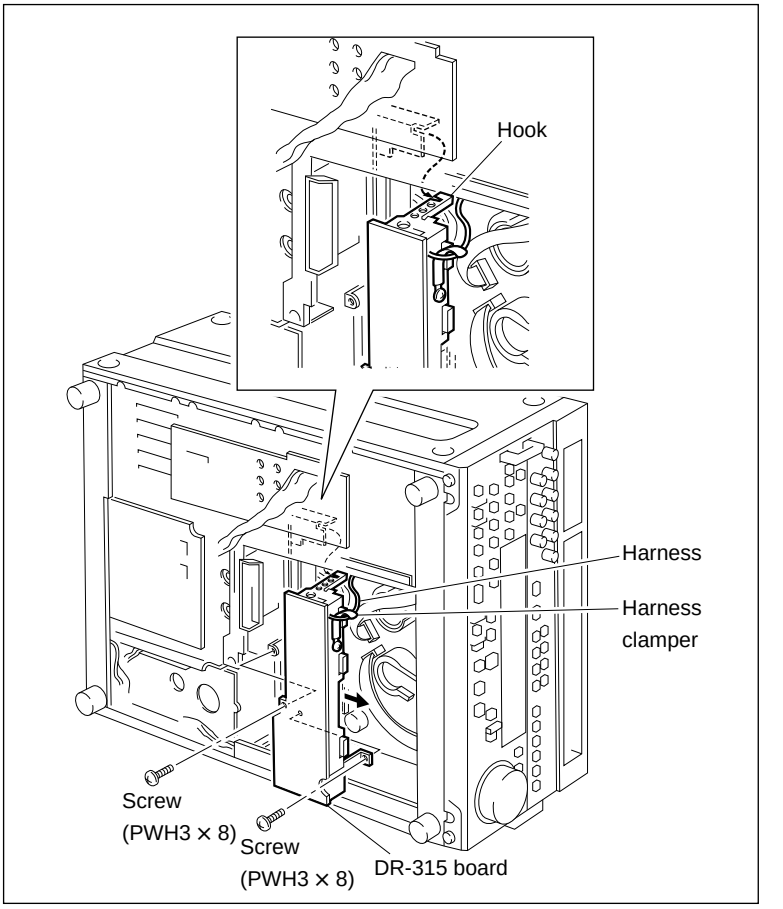
3. Remove the DR-315 Board

(1) Strech the harness clamper and release the harness.
(2) Remove the two screws shown in the figure.
(3) Move the DR-315 board toward the reel motors about 1 cm, and detach the hook.

Note

The hook is hard to be seen since it is the inner part.

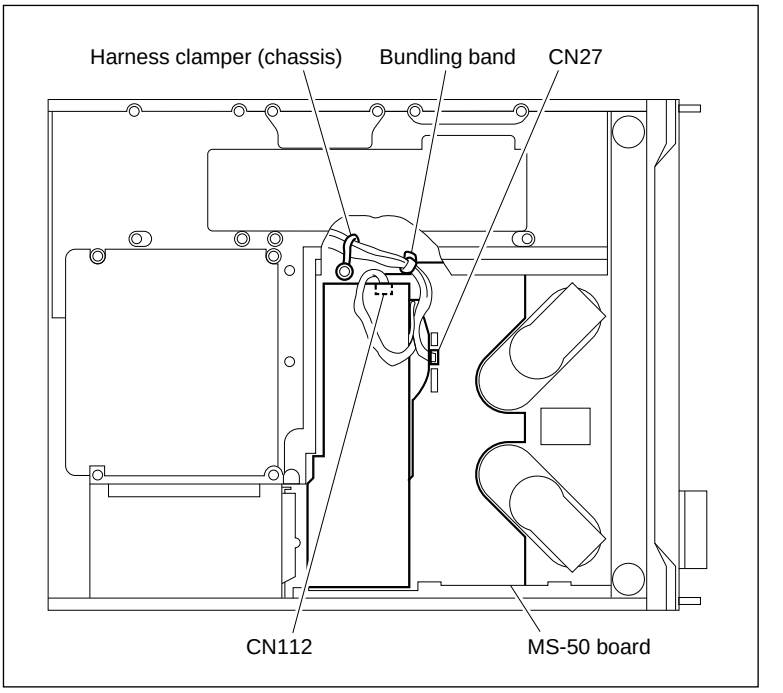
(4) Pull out the DR-315 board as far as possible with connectors are connected state.



Remove the DR-315 Board

4. Harness Disconnection

(1) Strech the harness clamper (chassis) shown in the figure.
(2) Cut off the bundling band.
(3) Disconnect the harness from the connector CN112 on the DR-315 board.
(4) Disconnect the harness from the connector CN27 on the MS-50 board.



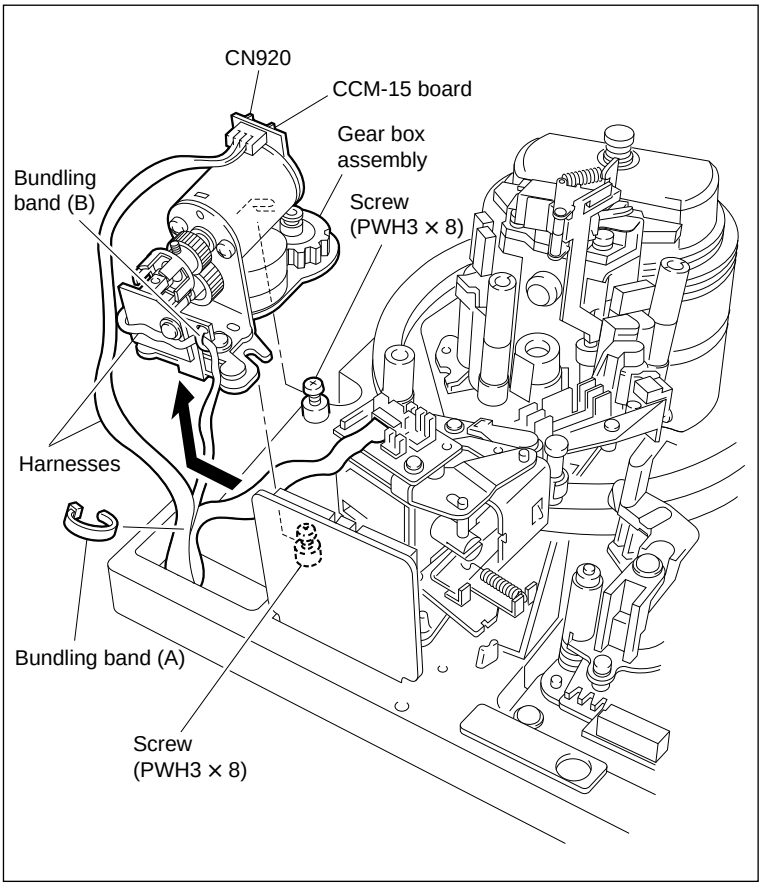
Harness Disconnection

5. Gear Box Assembly Removal

(1) Cut off the bundling band (A) shown in the figure.
(2) Remove the two screws and remove the gear box assembly.
(3) Cut off the bundling band (B) shown in the figure.
(4) Disconnect the two harnesses from the gear box assembly.

Note

The steps 6 through 9 are not required when the gear box assembly is replaced.



Gear Box Assembly Removal

6. Threading Motor Removal

(1) Loosen the set screw of the M gear.
(2) Remove the two screws fixing the motor.

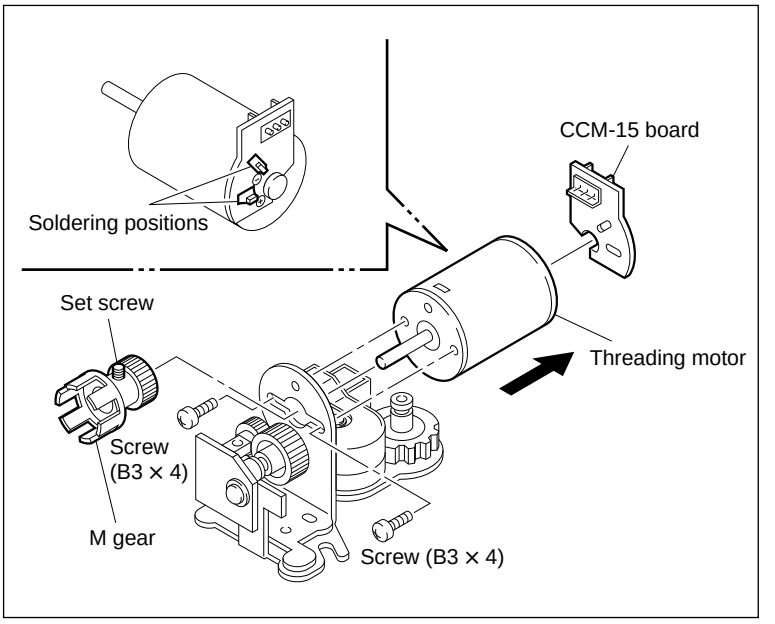
Note

Take care that the screwdriver does not strike against the M gear.

(3) Remove the motor. (The M gear can also be removed simultaneously.)

7. CCM-15 Board Removal

Unsolder and remove the CCM-15 board.



Threading Motor Removal

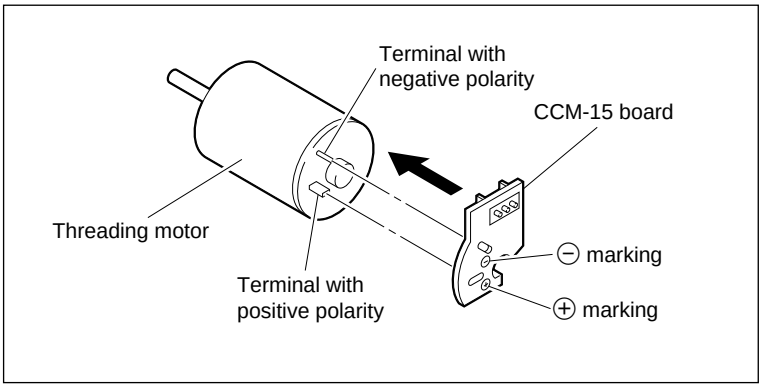
Installation

8. CCM-15 Board Mounting

Pass the pins of the threading motor through the CCM-15 board and solder them.

Note

Solder so that no clearance exists between the motor and CCM-15 board.



CCM-15 Board Mounting

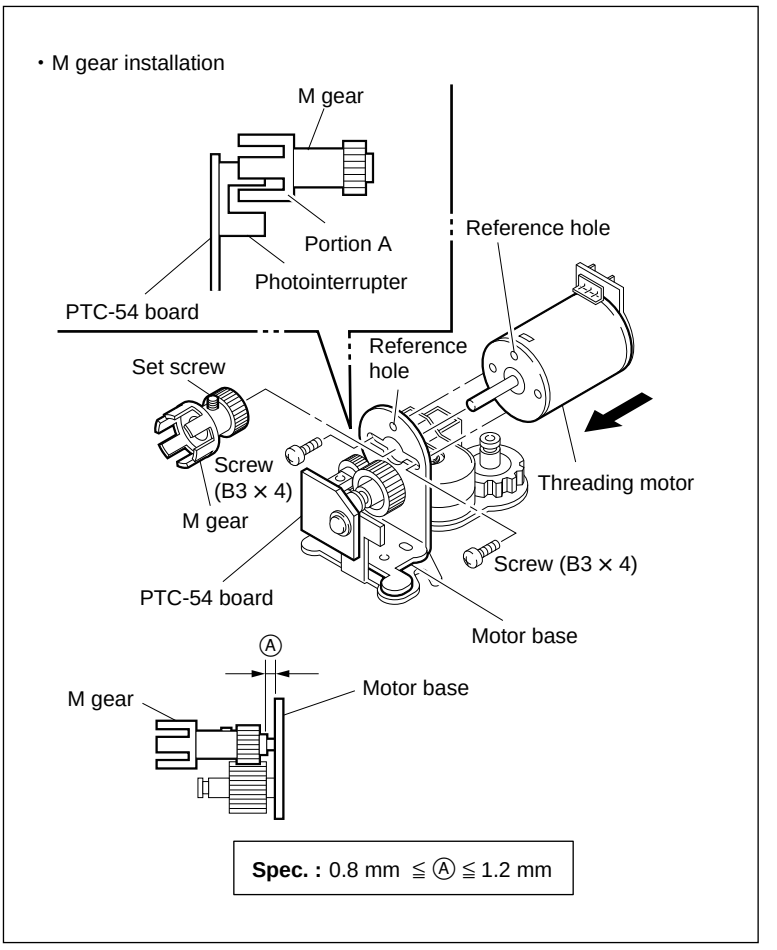
9. Threading Motor Installation

(1) Put portion A of the M gear into the photointerrupter on the PTC-54 board.
(2) Pass the motor shaft through the hole of the motor base and align the reference hole position of the motor with that of the motor base.
(3) Slightly apply the locking compound to the motor fixing screws and tighten them.

Note

Take care that the screwdriver does not strike against the M gear.

(4) Put the thickness gauge (1.0 mm thick) between the M gear and motor base.
(5) Tighten the set screw while slightly pushing the M gear toward the motor base.
(6) Pull out the thickness gauge.
(7) Confirm that the clearance between the M gear and motor base satisfies the specification when the M gear is pushed toward the motor base.
(8) Confirm that the M gear smoothly rotates when manually rotating the M gear. Moreover, confirm that the M gear does not touch the photointerrupter.



Threading Motor Installation

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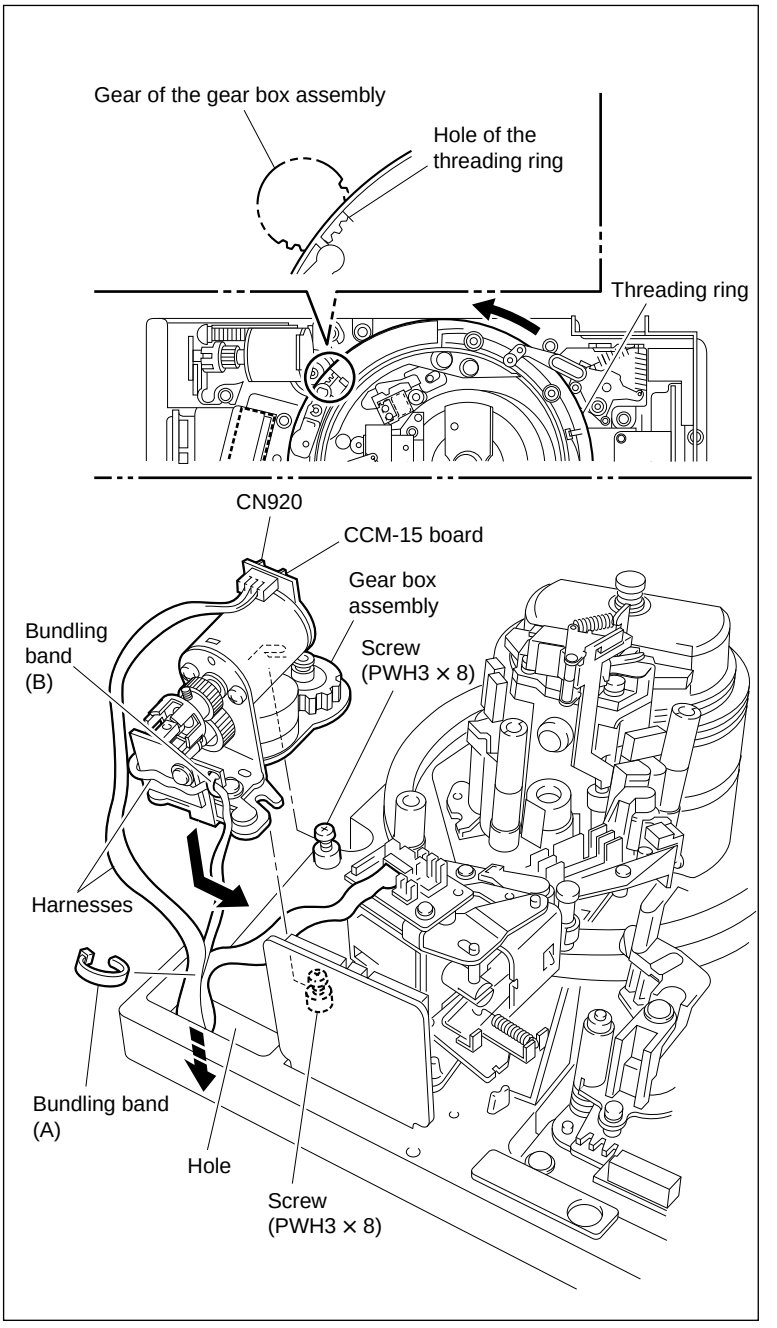
10. Gear Box Assembly Installation

(1) Disconnect the two harness from a new gear box assembly.
(2) Connect the two harness in (4) of procedure 5 to a new gear box assembly.
(3) Bundle the harness released in (3) of step 5 using a new bundling band (A) (or the equivalent).
(4) Rotate the threading ring so that the pinch roller places in front of the pinch solenoid.

Note

Move the hole of the threading ring to confirm the engagement of the gear when the gear box assembly is installed.

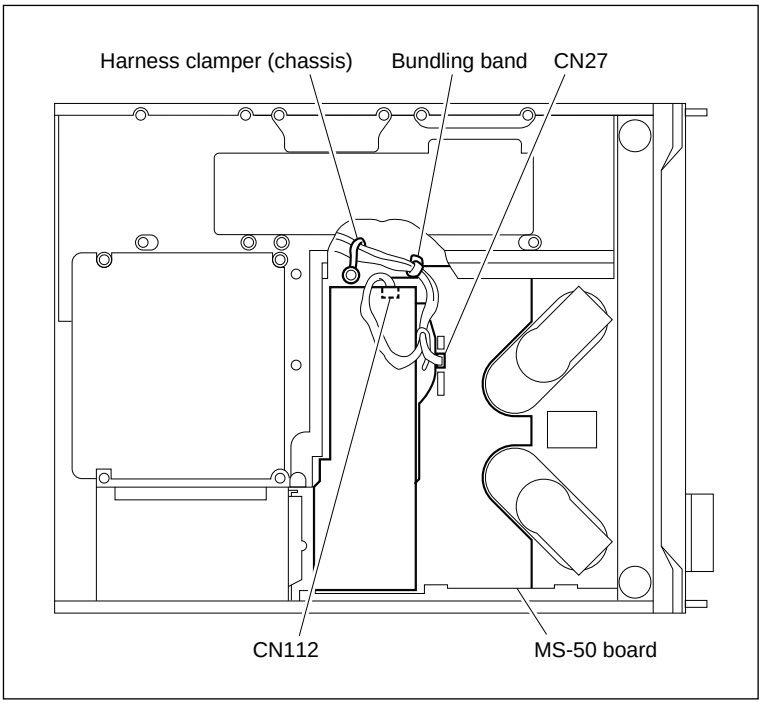
(5) Push the gear of the gear box assembly against that of the threading ring.
(6) Confirm from the hole of the threading ring that the gear of the gear box assembly engages with that of the threading ring.
(7) Tighten the screws while slightly pushing the gear box assembly toward the threading ring.
(8) Pass the two harness of the gear box assembly through the rear side from the hole of the mechanical deck, and put them to the rear side of the mechanical deck.
(9) Bundle the harness using a new bundling band (B) (or the equivalent).



Gear Box Assembly Installation

11. Harness connection

(1) Connect the harness (3-pin) to the connector CN27 on the MS-50 board.
(2) Connect the harness (2-pin) to the connector CN112 on the DR-315 board.
(3) Bundle the harness with a new bundling band (or the equivalent).
(4) Fix the harness with the harness clamper (chassis).



Harness Connection

12. Install the DR-315 Board

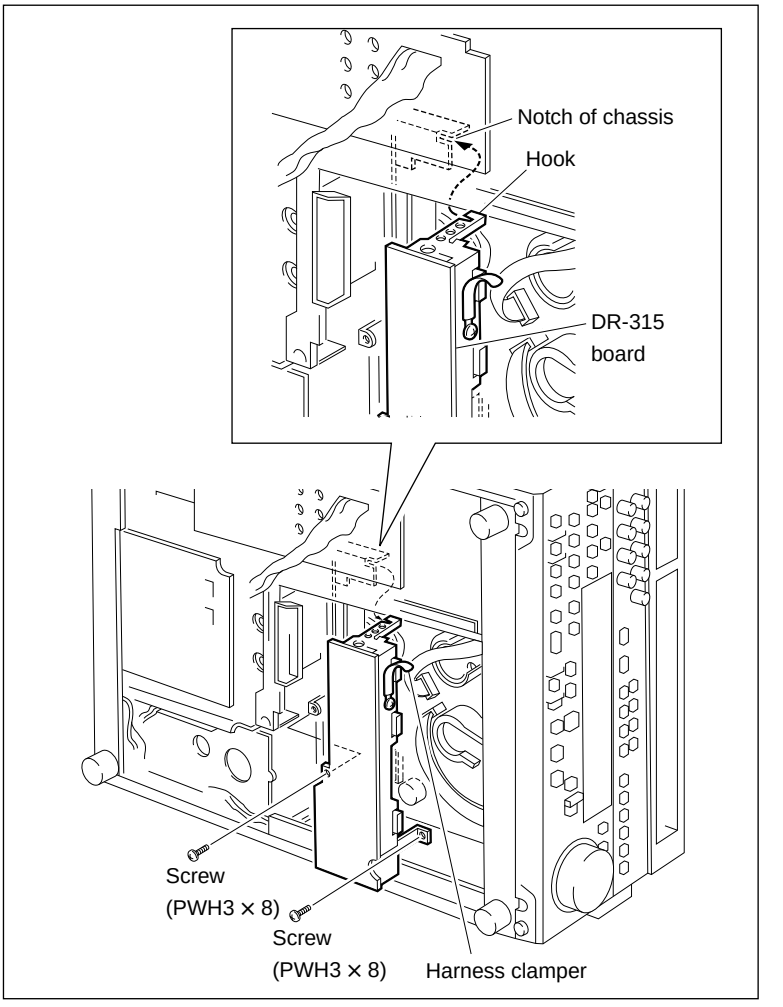
(1) Put the hook of the DR-315 board into the notch of the chassis shown in the figure.
(2) Install the DR-315 board with the two screws.
(3) Clamp the released harness in the step 3-(1).

13. Install the Hard Disk Drive Unit

Install the hard disk drive unit.
(Refer to Section 5-31-2.)

14. Install the Bottom Plate

Install the bottom plate with the six screws.



Install the DR-315 Board

Adjustment after Replacement

15. Threading Motor Operation Confirmation

Refer to Section 4-2-2 in Maintenance Manual Part 1.
(C012: THREADING MOTOR)

5-20. Threading Ring and Ring Roller Replacement

Outline

Replacement

1. Flexible Board Removal (CN2/SE-341 Board)
2. Harness Disconnection (AT Head Board)
3. Pinch Arm Guard Removal
4. CL Guide Rail Removal
5. Pinch Pressure Assembly Removal
6. S Plate Assembly Removal
7. S Tension Regulator Assembly Removal
8. Harness Removal (Demagnetization Head Assembly)
9. T Drawer Assembly Removal
10. Gear Box Assembly Removal (Refer to steps 1 through 5 in Section 5-19.)
11. Ring Roller Removal
12. Threading Ring Assembly Removal
13. Ring Rollers (A) and (C) Installation
14. Cleaning (Threading Ring Assembly)
15. Threading Ring Assembly Installation
16. Ring Roller (B) Installation
17. Gear Box Assembly Installation (Refer to steps 10 through 14 in Section 5-19.)
18. Threading Ring Operation Confirmation
19. S Plate Assembly Installation
20. Pinch Pressure Assembly Installation
21. Put the Unit into the Unthreading End State.
22. S Tension Regulator Assembly Installation
23. T Drawer Assembly Installation
24. T Drawer Assembly Operation Confirmation
25. CL Guide Rail Installation
26. CL Arm Assembly Operation Confirmation
27. Pinch Arm Guard Installation
28. Flexible Board Mounting (CN2/SE-341 Board)
29. Harness Connection (AT Head Board)
30. Harness Connection (Demagnetization Head Assembly)
31. Pinch Pressure Clearance Adjustment (Refer to Section 5-12-2.)
32. Tape Running Confirmation (Refer to Section 7-1-2.)

Preparation

1. Turn off the power.
2. Remove the upper lid. (Refer to Section 2-3-1 in Maintenance Manual Part 1.)
3. Remove the plate MD assembly. (Refer to Section 2-4 in Maintenance Manual Part 1.)
4. Remove the cassette compartment assembly. (Refer to Section 2-5 in Maintenance Manual Part 1.)

Tools

- Cleaning cloth: 3-184-527-01
- Cleaning fluid: 9-919-573-01

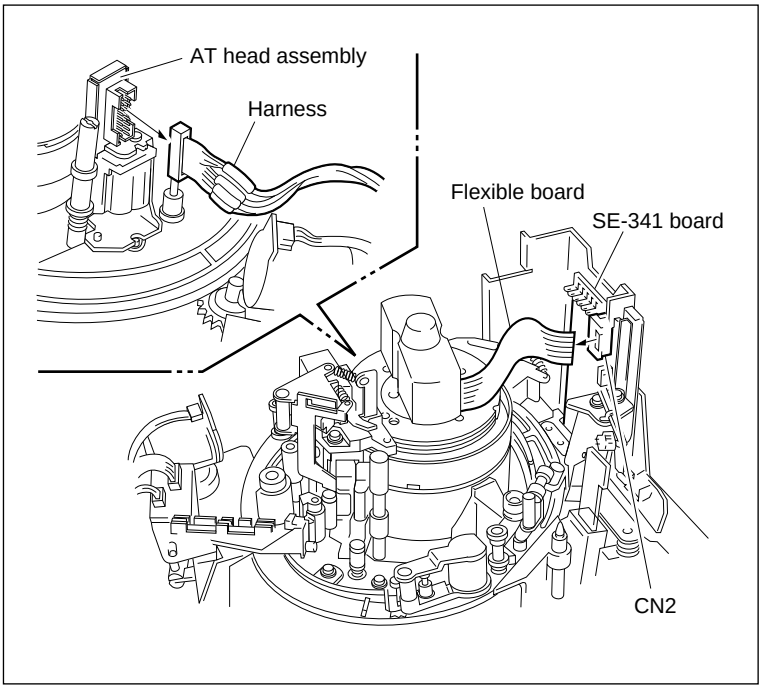
Removal

1. Flexible Board Removal

Remove the flexible board from the connector CN2 on the SE-341 board.

2. Harness Disconnection

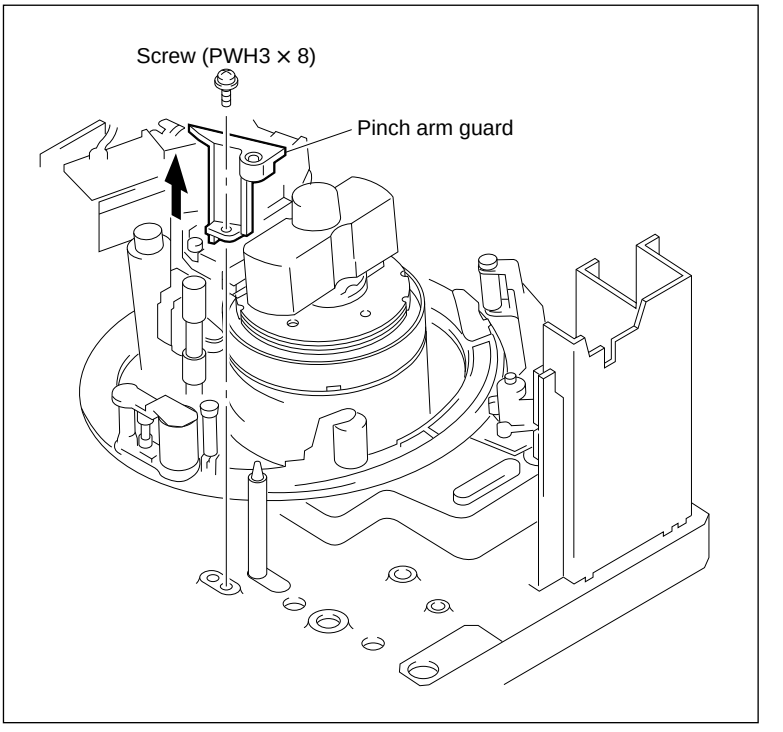
Disconnect the harness from the connector on the AT head assembly.



Flexible Board Removal/Harness Disconnection

3. Pinch Arm Guard Removal

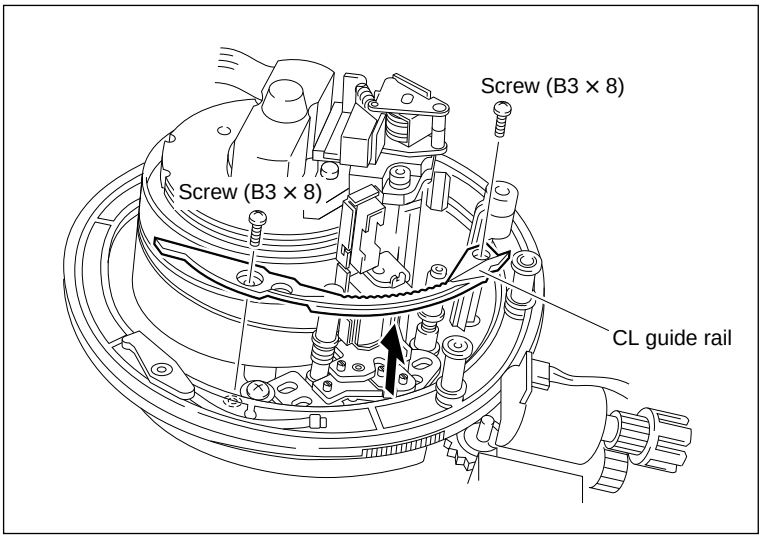
Remove the screw, then remove the pinch arm guard.



Pinch Arm Guard Removal

4. CL Guide Rail Removal

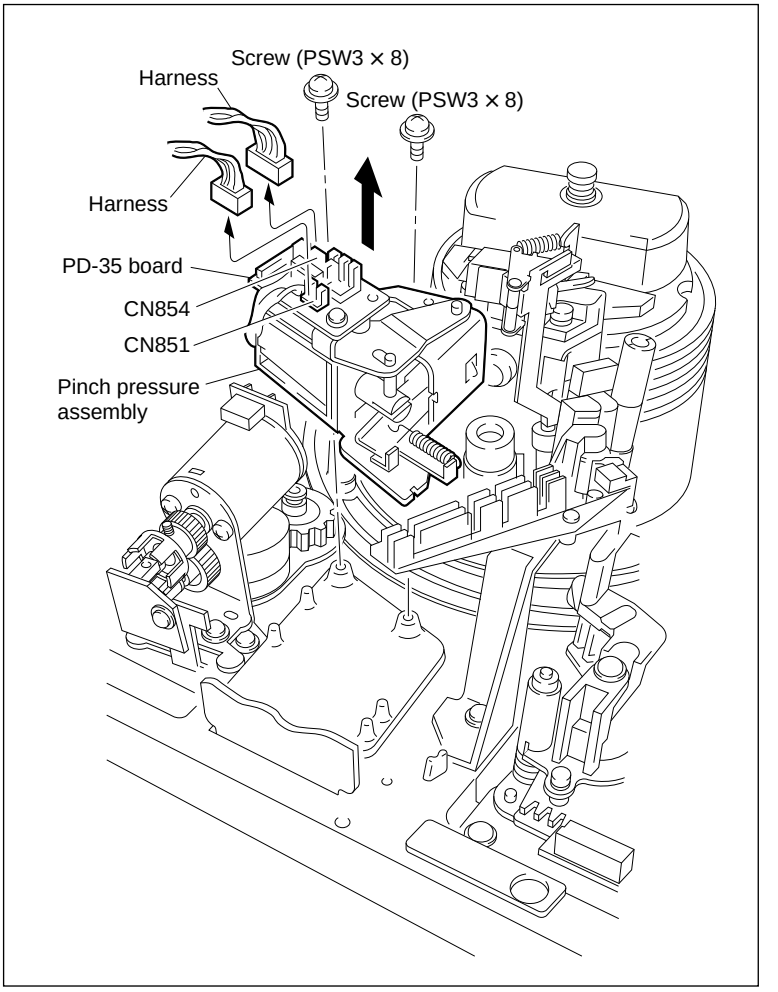
Remove the screws, then remove the CL guide rail.



CL Guide Rail Removal

5. Pinch Pressure Assembly Removal

(1) Disconnect the two harnesses from the connectors CN851 and CN854 on the PD-35 board.
(2) Remove the two screws, then remove the pinch pressure assembly.



Pinch Pressure Assembly Removal

6. S Plate Assembly Removal

(1) Remove the bundling band and disconnect the harness from the connector CN200 on the TC-96 board.

(2) Remove the bundling band and disconnect the harness from the connectors on the CTL head board, full-erase head board and tape end sensor board.

(3) Unhook each harness (CTL head, cleaning roller and tape end sensor) from the sensor holder.

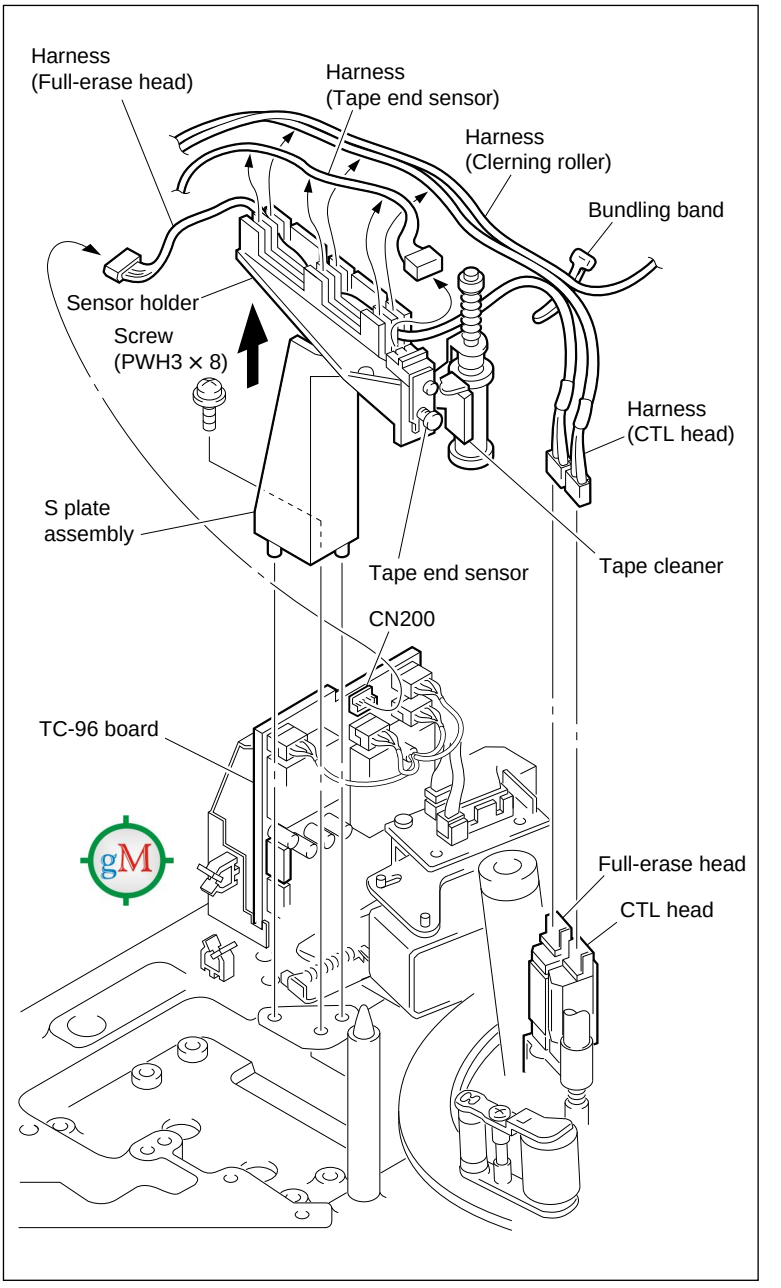
Note

Never unhook the harness for full-erase head from the sensor holder.

(4) Remove the screw, then remove the S plate assembly.

CAUTION

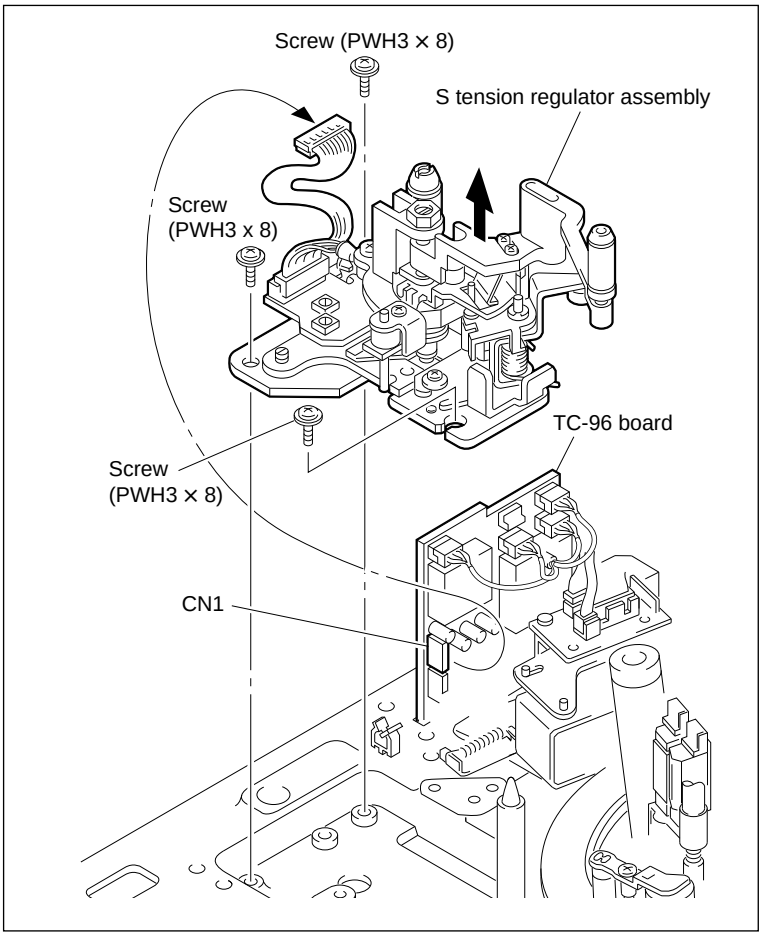
The tape cleaner has a sharp edge. Pay careful attention when handling the tape cleaner.



S Plate Assembly Removal

7. S Tension Regulator Assembly Removal

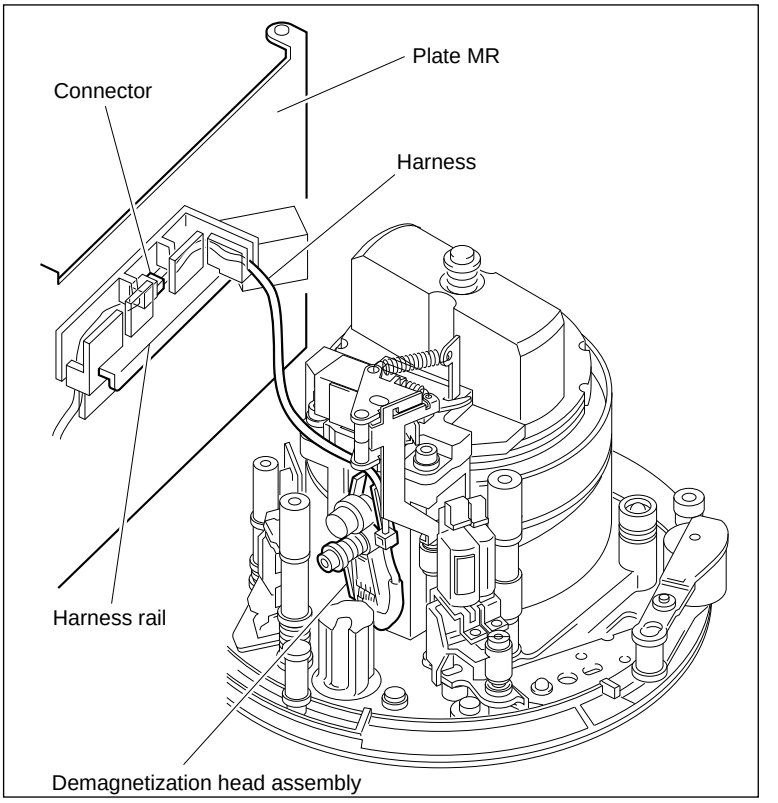
(1) Disconnect the harness from the connector CN1 on the TC-96 board.
(2) Remove the three screws, then remove the S tension regulator assembly.



S Tension Regulator Assembly Removal

8. Disconnect the Harness

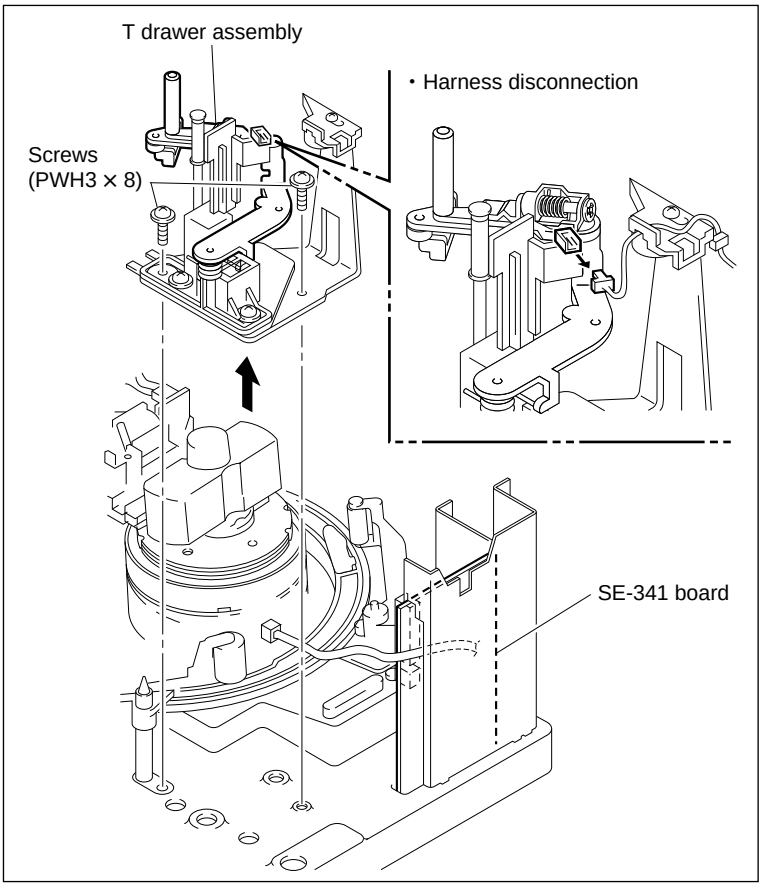
Remove the harness of demagnetization head assembly from the harness rail, then disconnect the connector as shown in the figure.



Disconnect the Harness

9. T Drawer Assembly Removal

(1) Disconnect the harness from the connector of the tape top sensor.
(2) Remove the two screws, then remove the T drawer assembly.



T Drawer Assembly Removal

10. Gear Box Assembly Removal

Refer to steps 1 through 5 in Section 5-19.

11. Ring Roller Removal

(1) Remove the screws, then remove the ring rollers (A) and (B).

Note

Be careful not to touch the drum (especially, video heads).

(2) Move the threading ring in the direction indicated by the arrow.

(3) Remove the screw, then remove the ring roller (C).

Note

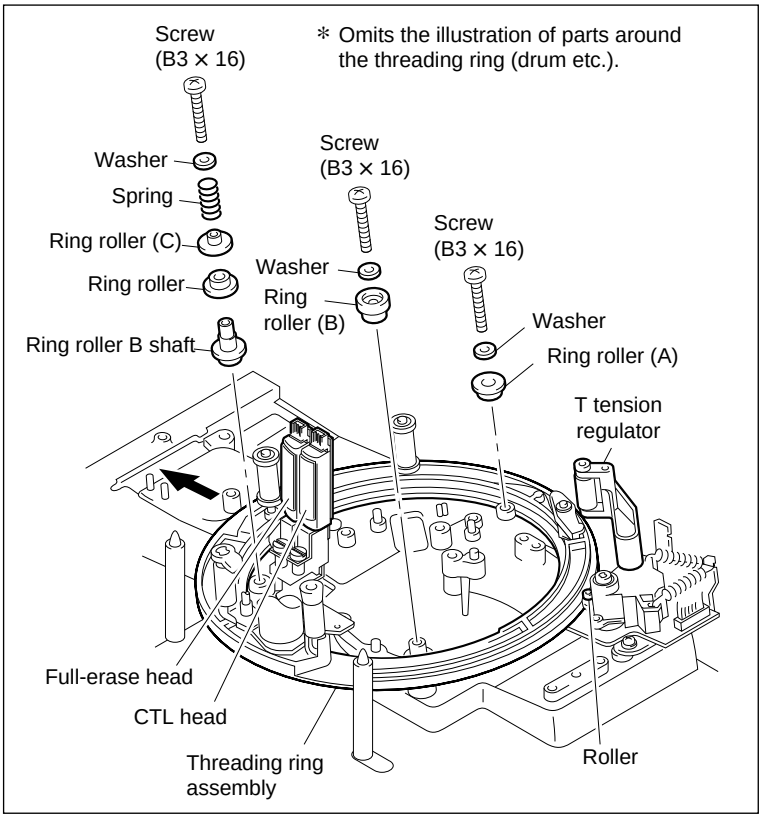
Be careful not to damage the CTL head or full-erase head.

12. Threading Ring Assembly Removal

Remove the threading ring assembly from the chassis.

Note

Be careful not to damage the drum (especially, video heads or upper drum's tape running surface) and capstan motor shaft at that time.



Ring Roller Removal/Installation

Installation

13. Ring Rollers (A) and (C) Installation

(1) Assemble the ring rollers (A) and (C) in the order shown in the figure in step 11 and install them in the chassis.

Note

Be careful not to damage the CTL head or full-erase head.

14. Cleaning

Clean the inside of a new threading ring assembly using a cleaning cloth moistened with cleaning fluid.

15. Threading Ring Assembly Installation

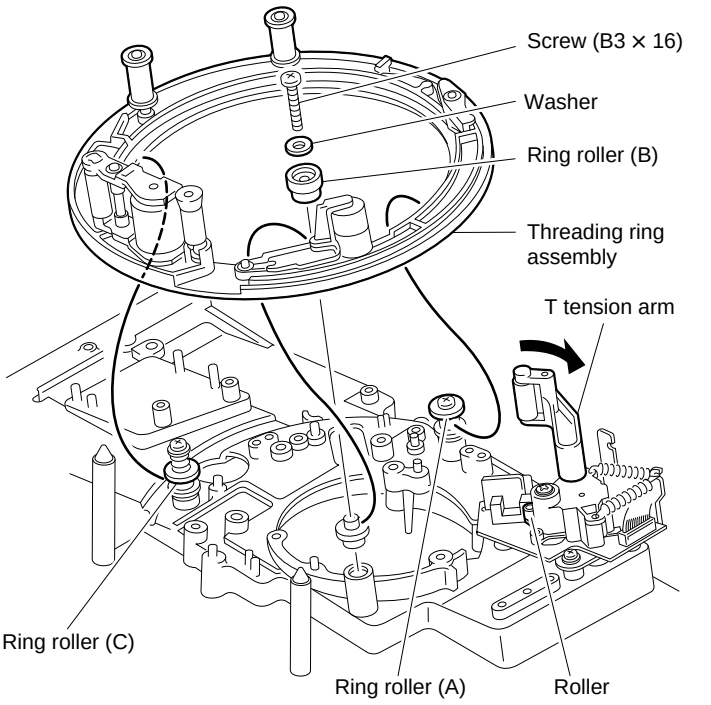
Push the T tension arm in the direction indicated by the arrow and install the threading ring assembly while putting it in the grooves of the ring rollers (A) and (C).

16. Ring Roller (B) Installation

(1) Pass the ring roller (B) through the roller shaft and tighten the screw while holding the threading ring assembly so that it is not dislocated from the grooves of the ring rollers (A) and (C).

(2) Confirm that the threading ring assembly is put between the three ring rollers. Moreover, confirm that the T tension regulator roller is not dislocated from the side of the threading ring.

∗ Omits the illustration of parts around the threading ring (drum etc.).



Threading Ring Assembly Installation

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17. Gear Box Assembly Installation

Refer to steps 10 through 15 in Section 5-19.

18. Threading Ring Operation Confirmation

Turn the M gear of the gear box assembly for threading and unthreading directions, and confirm that the threading ring and three ring rollers smoothly rotate.

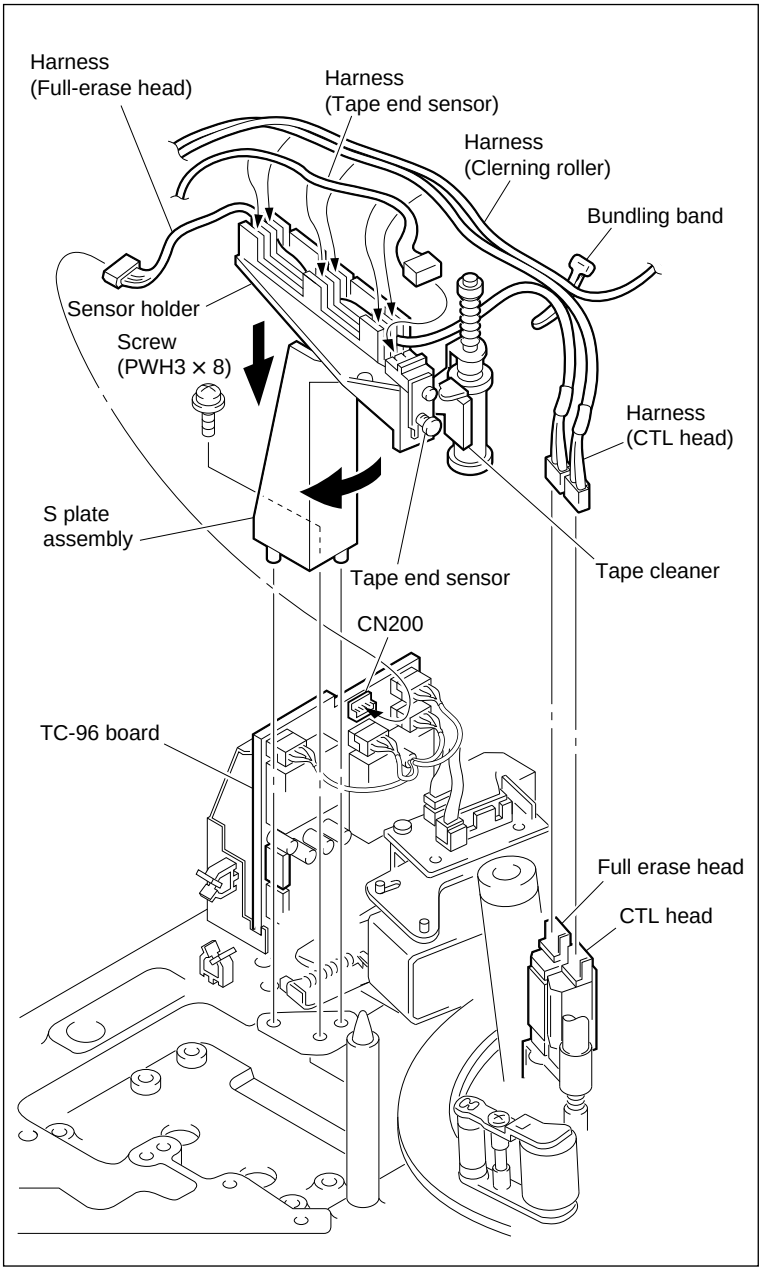
19. S Plate Assembly Installation

(1) Insert the pins of the S plate assembly into the holes of the chassis and tighten the screw while moving the S plate assembly clockwise.

CAUTION

The tape cleaner has a sharp edge. Pay careful attention when handling the tape cleaner.

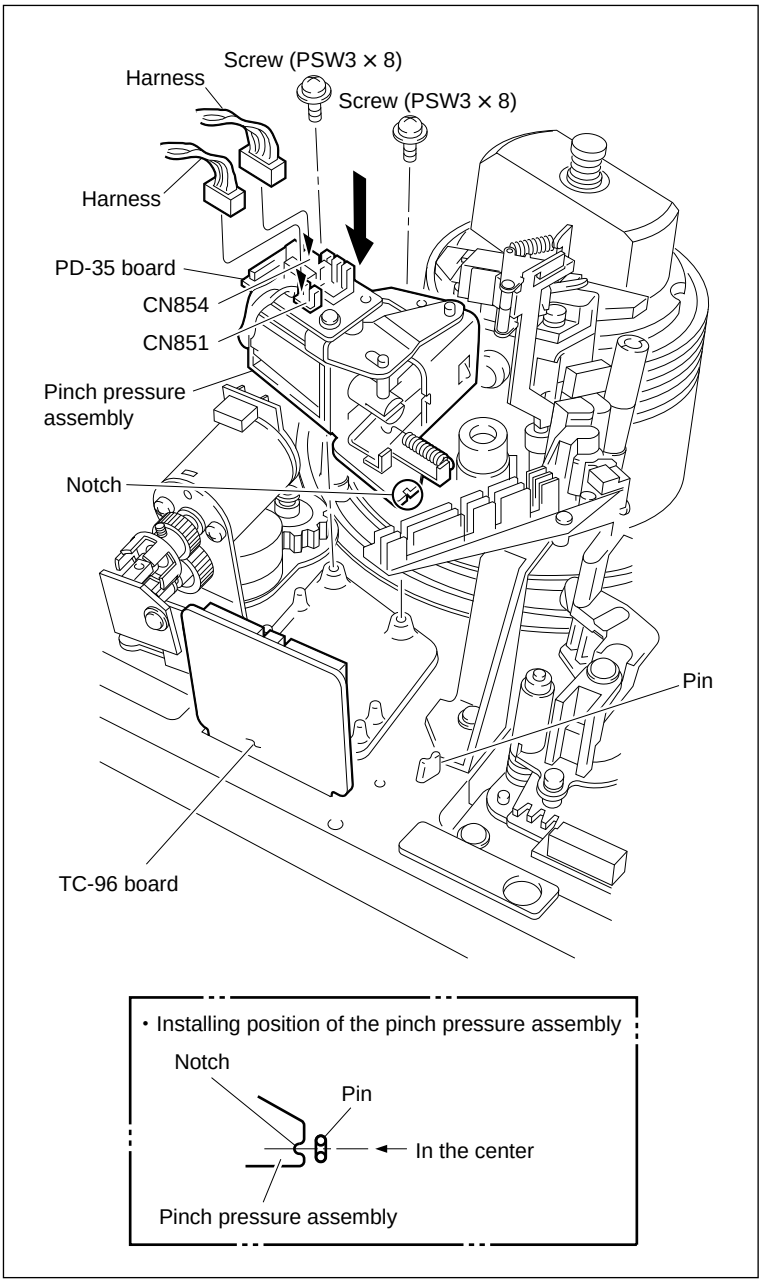
(2) Connect the harness to the connector CN200 on the TC-96 board.
(3) Fix the harness with a bundling band (or the equivalent).
(4) Connect each harness to the connectors on the CTL head board, full-erase head board, and tape end sensor board.
(5) Clamp each harness (CTL head, cleaning roller and tape end sensor) to the groove of the sensor holder.
(6) Fix the harnesses with a new bundling band (or the equivalent).



S Plate Assembly Installation

20. Pinch Pressure Assembly Installation

(1) Align the notch of the pinch pressure assembly with the center of the pin of the chassis, and tighten the two screws.
(2) Connect each harness to the connectors CN851 and CN854 on the PD-35 board.

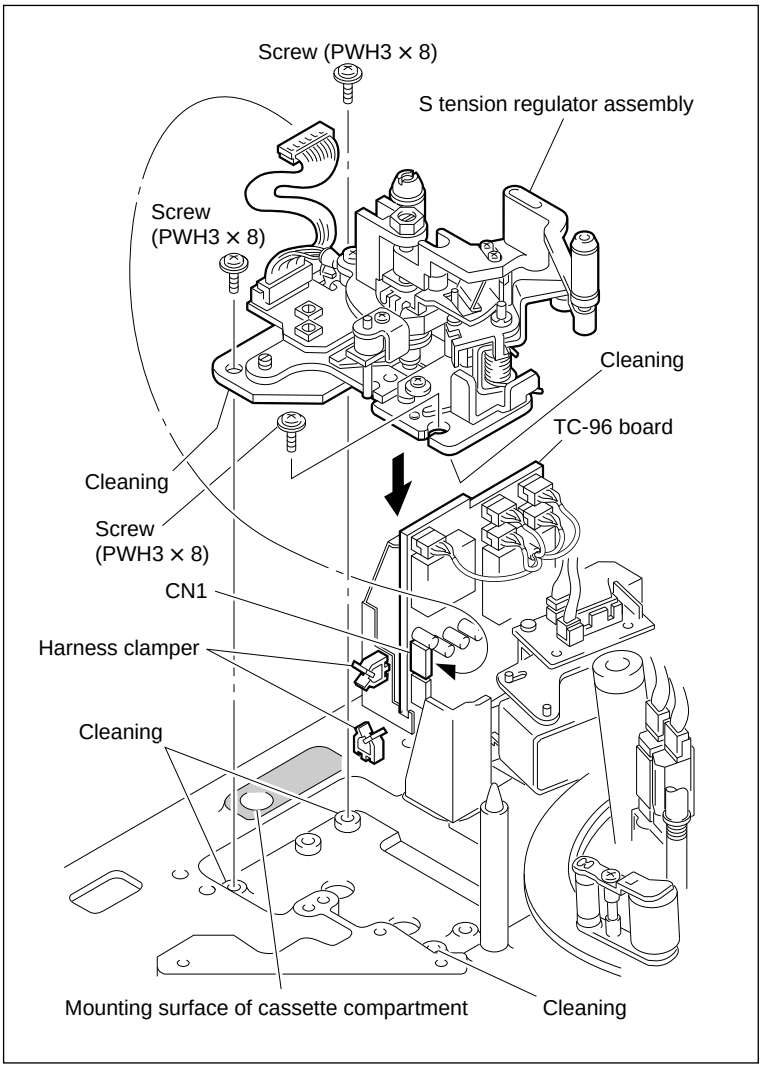


Pinch Pressure Assembly Installation

21. Put the Unit into the Unthreading End State.

22. S Tension Regulator Assembly Installation

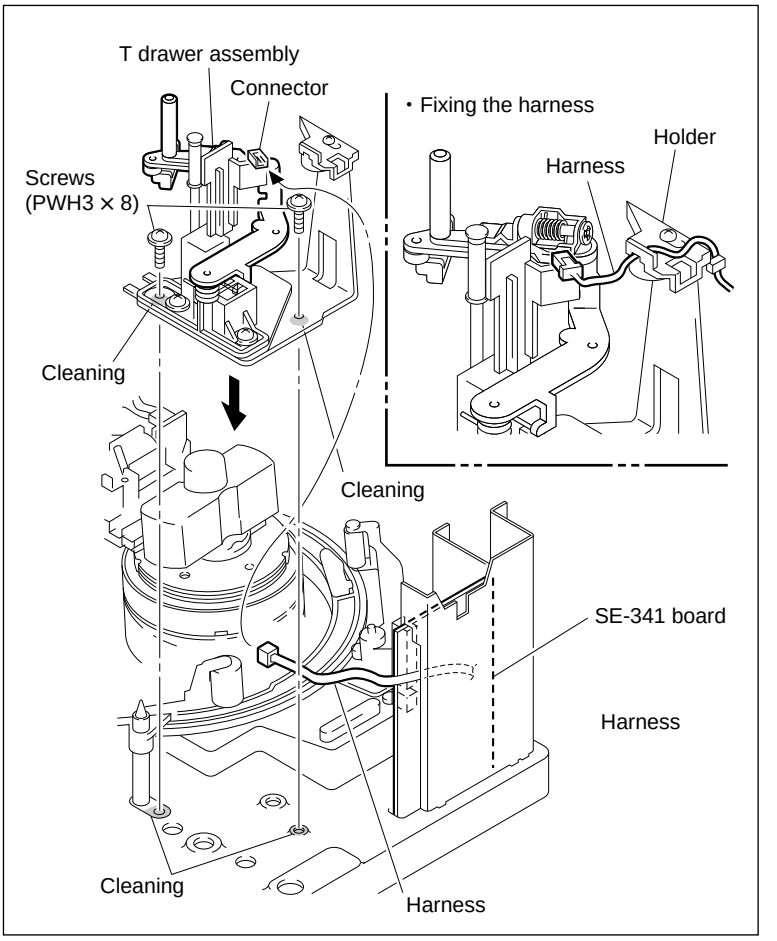
(1) Clean the mounting surfaces of the S tension regulator assembly and chassis in the three portions.
(2) Set the S tension regulator assembly and tighten with the three screws.
(3) Connect the harness to the connector CN1 on the TC-96 board.
(4) Put the harness in the harness clamper.
(5) Confirm that the harness does not protrude into the mounting surface (portion in the figure) of the cassette compartment.



S Tension Regulator Assembly Installation

23. T Drawer Assembly Installation

(1) Clean the mounting surface of the T drawer assembly and chassis.
(2) Set the T drawer assembly and tighten with the two screws.
(3) Connect the harness to the connector of the tape top sensor.
(4) Fix the harness to the holder of the adjustment plate.



T Drawer Assembly Installation

24. T Drawer Assembly Operation Confirmation

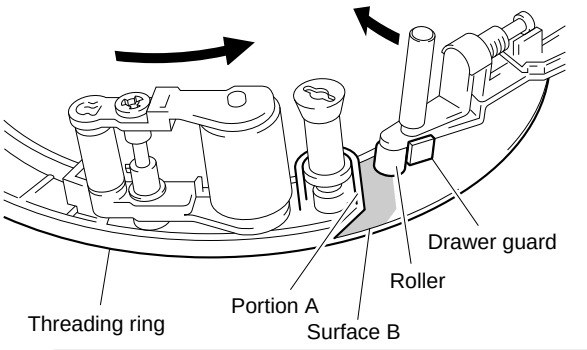
(1) Confirm that portion A of the threading ring is securely pushing the roller and drawer guard of the T drawer assembly during threading. Moreover, confirm that the lower surface of the roller does not touch with the surface B (portion in the figure) of the threading ring at that time. (Specification 1)

If specification 1 is not satisfied, adjust the height and vertical play of the T drawer arm. (Refer to step 9 in Section 5-18-1.)

(2) Confirm that the roller of the T drawer assembly smoothly moves along the inside of the threading ring during unthreading. Moreover, confirm that the lower surface of the roller does not touch with the surface B (portion in the figure) of the threading ring at that time. (Specification 2)

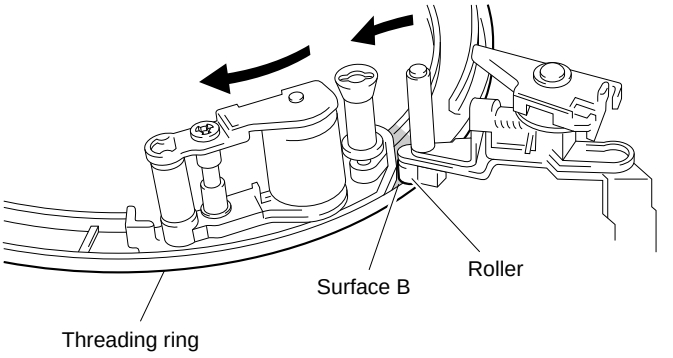
If specification 2 is not satisfied, adjust the height and vertical play of the T drawer arm. (Refer to step 9 in Section 5-18-1.)

・Threading



Spec. 1 : At the threading state, the lower surface of the roller does not touch with the surface B of the threading ring.

・Unthreading

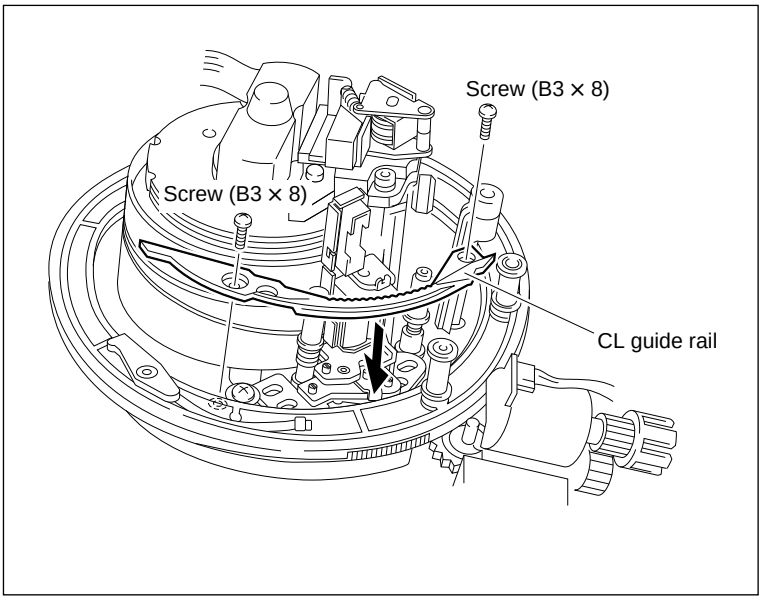


Spec. 2 : At the unthreading state, the lower surface of the roller does not touch with the surface B of the threading ring.

T Drawer Assembly Operation Confirmation

25. CL Guide Rail Installation

Install the CL guide rail with two screws.

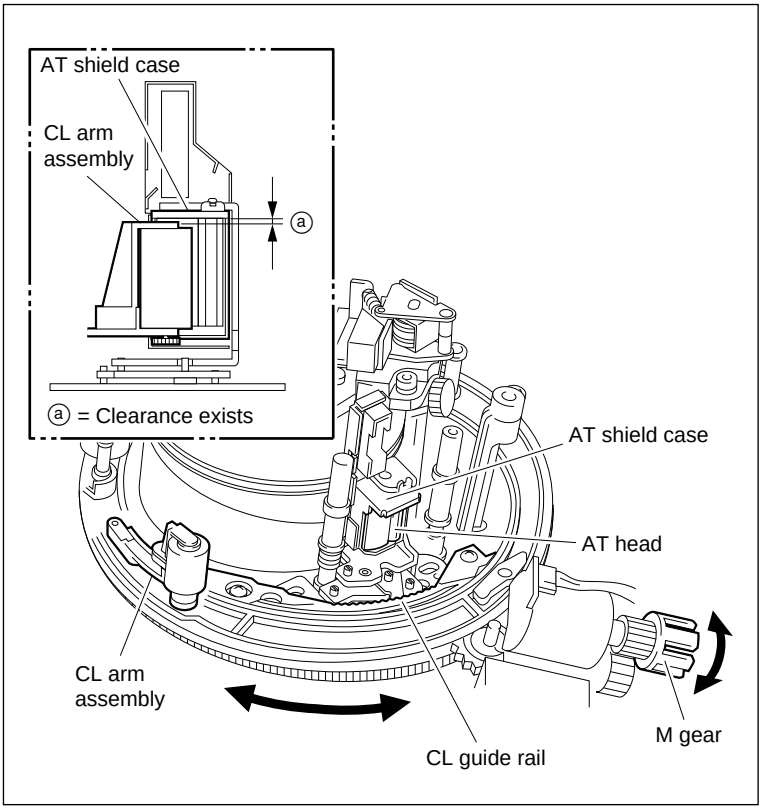


CL Guide Rail Installation

26. CL Arm Assembly Operation Confirmation

Turn the M gear of the gear box assembly and confirm the following items while repeating the threading and unthreading.

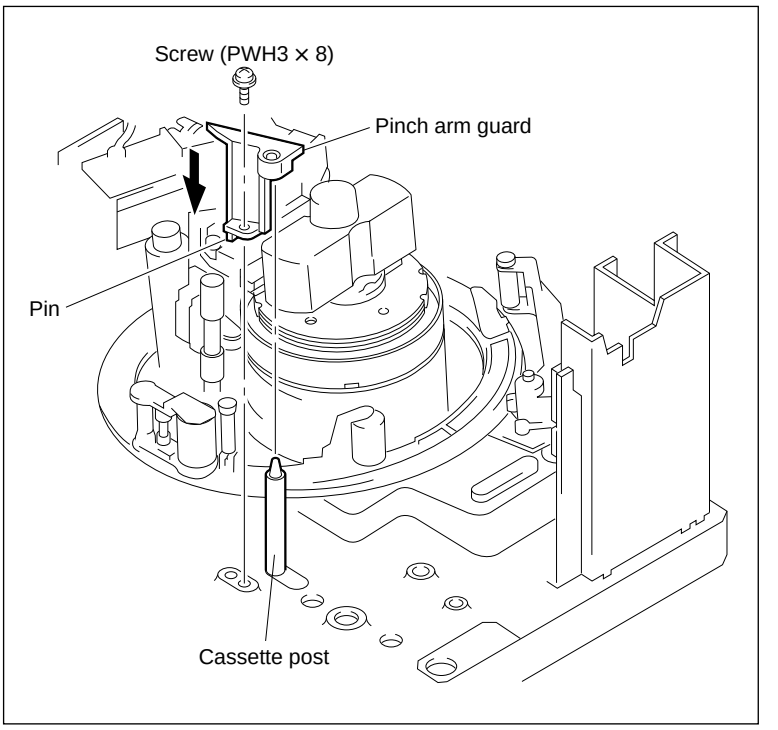
- The CL arm assembly moves along the CL guide rail.
- The cleaning roller cleans the AT head.
- A clearance exists between the top of the CL arm assembly and the AT shield case when the cleaning roller cleans the AT head.



CL Arm Assembly Operation Confirmation

27. Pinch Arm Guard Installation

(1) Pass the pinch arm guard through the cassette post and put the pin into the chassis hole.
(2) Tighten the screw.



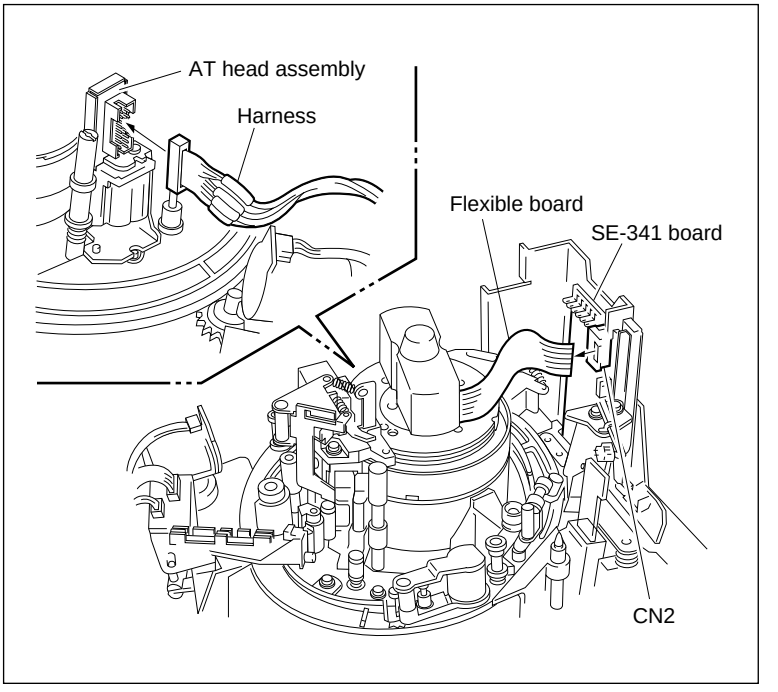
Pinch Arm Guard Installation

28. Flexible Board Mounting

Connect the flexible board to connector CN2 on the SE-341 board, then lock.

29. Harness Connection

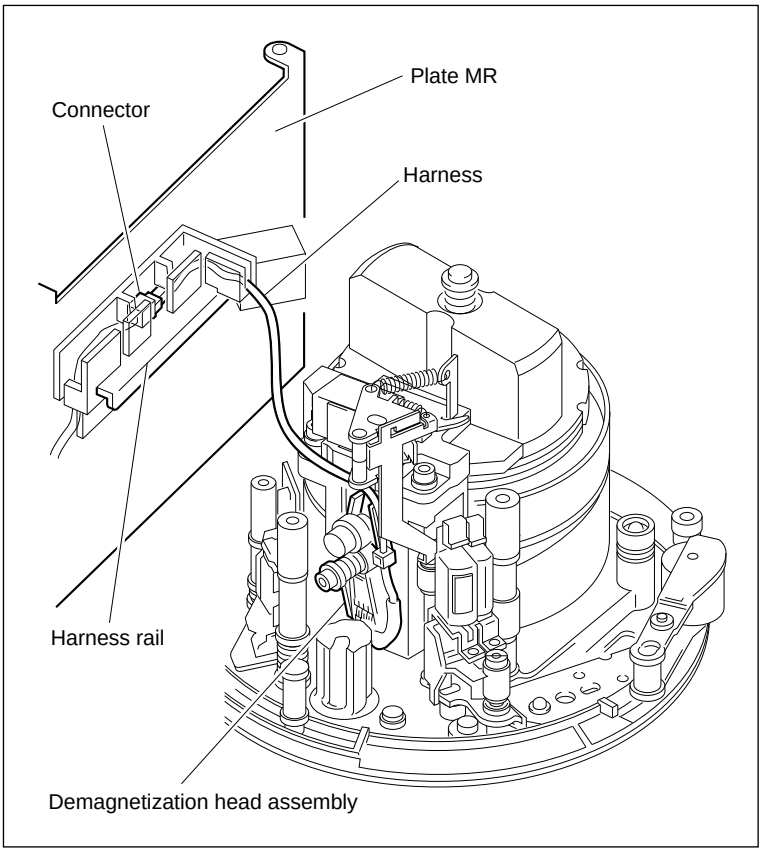
Connect the harness to the connector of the AT head assembly



Flexible Board Mounting/Harness Connection

30. Connect the Harness

Connect the harness of the demagnetization head assembly on the harness rail, then clamp it in the harness rail as shown in the figure.



Connect the Harness

Adjustment after Replacement

31. Pinch Pressure Clearance Adjustment

Refer to Section 5-12-2.

32. Tape Running Confirmation

Refer to Section 7-1-2.

5-21. Reel Table Assembly Replacement

Outline

Replacement

1. Reel Table Assembly Removal
2. Reel Table Assembly Installation

Adjustment after replacement

3. Reel Table Height Confirmation (Refer to Section 5-9-4.)
4. Reel Brake Clearance Confirmation (Refer to Section 5-9-5.)
5. Reel Brake Release Confirmation (Refer to Section 5-9-6.)
6. Reel Rotation Sensor Position Confirmation (Refer to Section 5-9-7.)
7. Reel FG Duty Adjustment
   (Refer to Section 4-2-7 in Maintenance Manual Part 1.)
   (A001: S REEL FG DUTY, A002: T REEL FG DUTY)

Note

The reel table assembly replacement is the same on the supply (S) and take-up (T) sides.

Preparation

1. Turn off the power.
2. Remove the upper lid. (Refer to Section 2-3-1 in Maintenance Manual Part 1.)
3. Remove the plate MD assembly. (Refer to Section 2-4 in Maintenance Manual Part 1.)
4. Remove the cassette compartment assembly. (Refer to Section 2-5 in Maintenance Manual Part 1.)

Tools

- L wrench (Across flat has 1.5 mm): 7-700-736-05
- Cleaning cloth: 3-184-527-01
- Cleaning fluid: 9-919-573-01

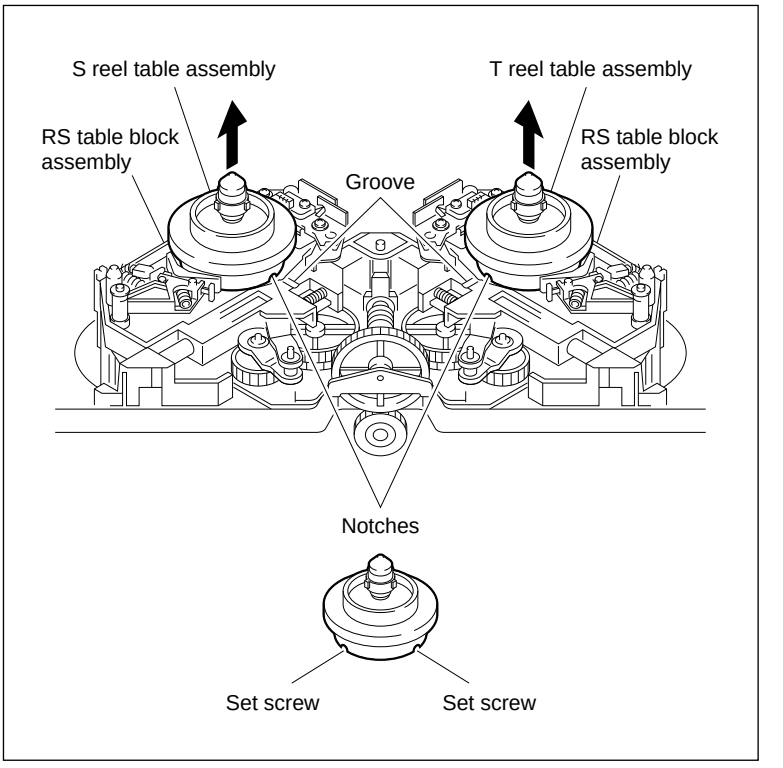
Removal

1. Reel Table Assembly Removal

(1) Align one of the two notches at the bottom of the reel table assembly with the groove position of the RS table block assembly.
(2) Insert the L wrench into the notch at the bottom of the reel table assembly along the groove of the RS table block assembly.
(3) Turn the set screw counterclockwise by 1/2 to one turn, then loosen.
(4) Align the other notch at the bottom of the reel table assembly with the groove position of the RS table block assembly.
(5) Loosen the set screw in the same way as in step (2).
(6) Remove the reel table assembly.

Note

A polywasher may be attached together when the reel table assembly is removed. In this case, remove the polywasher from the reel table assembly and return it to the reel motor shaft. The polywasher is used for reel table height adjustment.



Reel Table Assembly Removal

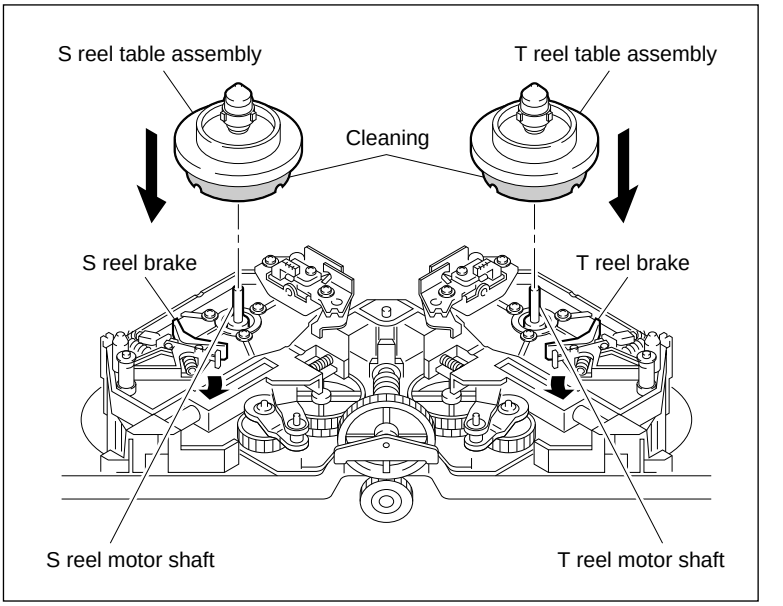
Installation

2. Reel Table Assembly Installation

(1) Clean the circumference of a new reel table assembly.
(2) Push the reel brake in the direction indicated by the arrow to make free, and pass the reel table assembly through the reel motor shaft.

Note

Tighten two set screws of the reel table assembly after the reel table height confirmation is complated.



Reel Table Assembly Installation

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Adjustment after Replacement

3. Reel Table Height Confirmation

Refer to Section 5-9-4.

4. Reel Brake Clearance Confirmation

Refer to Section 5-9-5.

5. Reel Brake Release Confirmation

Refer to Section 5-9-6.

6. Reel Rotation Sensor Position Confirmation

Refer to Section 5-9-7.

7. Reel FG Duty Adjustment

Refer to Section 4-2-7 in Maintenance Manual Part 1.
(A001: S REEL FG DUTY,
A002: T REEL FG DUTY)

5-22. Brake Lining Replacement

Outline

Replacement

1. Reel Table Assembly Removal
2. Brake Assembly Removal
3. Brake Lining Removal
4. Brake Lining Installation
5. Brake Assembly Installation
6. Reel Table Assembly Installation

Adjustment after Replacement

7. Reel Table Height Confirmation (Refer to Section 5-9-4.)
8. Reel Brake Clearance Confirmation (Refer to Section 5-9-5.)
9. Reel Brake Release Confirmation (Refer to Section 5-9-6.)

Notes

- The brake lining replacement is the same on the supply (S) and take-up (T) sides.
- Use a new E ring when the brake lining is replaced.
  E ring (2.3): 7-624-105-04

Preparation

1. Turn off the power.
2. Remove the upper lid. (Refer to Section 2-3-1 in Maintenance Manual Part 1.)
3. Remove the plate MD assembly. (Refer to Section 2-4 in Maintenance Manual Part 1.)
4. Remove the cassette compartment assembly. (Refer to Section 2-5 in Maintenance Manual Part 1.)

Tools

- L wrench (Across flat has 1.5 mm): 7-700-736-05
- Cleaning cloth: 3-184-527-01
- Cleaning fluid: 9-919-573-01

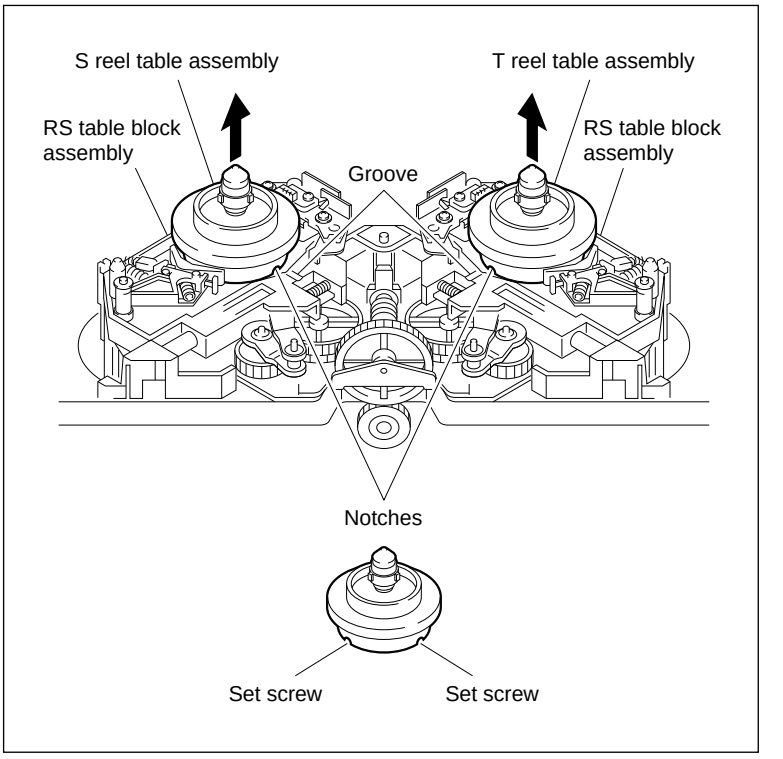
Removal

1. Reel Table Assembly Removal

(1) Align one of the two notches at the bottom of the reel table assembly with the groove position of the RS table block assembly.
(2) Insert the L wrench into the notch at the bottom of the reel table assembly along the groove of the RS table block assembly.
(3) Turn the set screw counterclockwise by 1/2 to one turn, then loosen.
(4) Align the other notch at the bottom of the reel table assembly with the groove position of the RS table block assembly.
(5) Loosen the set screw in the same way as in step (2).
(6) Remove the reel table assembly.

Note

A polywasher may be attached together when the reel table assembly is removed. In this case, remove the polywasher from the reel table assembly and return it to the reel motor shaft. The polywasher is used for reel table height adjustment.



Reel Table Assembly Removal

2. Brake Assembly Removal

(1) Remove the spring put on the RS table block assembly.
(2) Remove the E ring, then remove the brake assembly.

3. Brake Lining Removal

Remove the spring put on the brake arm block, then remove the brake lining.

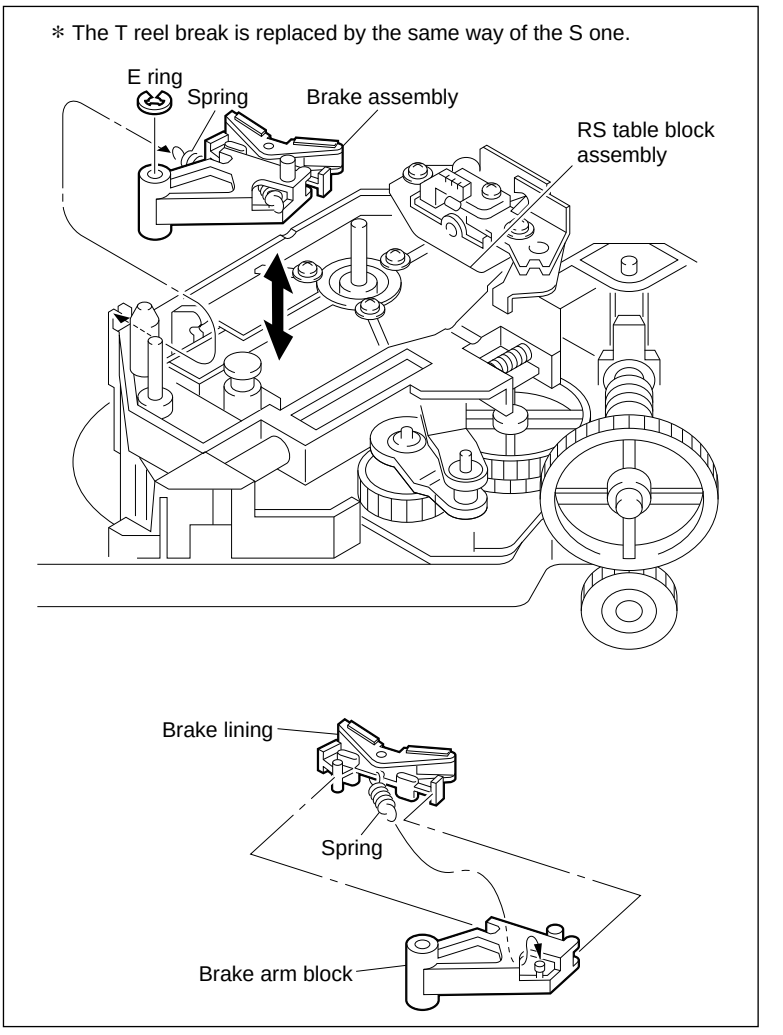
Installation

4. Brake Lining Installation

(1) Combine a new brake lining and brake arm block as shown in the figure.
(2) Hook the spring on the brake arm block.

5. Brake Assembly Installation

(1) Pass the brake assembly through the shaft of the RS table block assembly.
(2) Hook the spring on the RS table block assembly.
(3) Install the brake assembly with a new E ring.



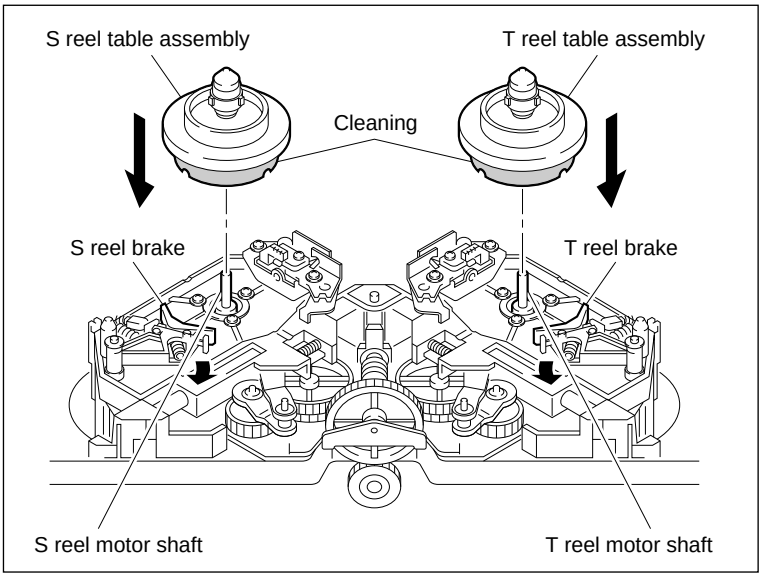
Brake Lining Removal/Installation

6. Reel Table Assembly Installation

(1) Clean the circumference of the reel table assembly.
(2) Push the reel brake in the direction indicated by the arrow to make free, and pass the reel table assembly through the reel motor shaft.

Note

Tighten two set screws of the reel table assembly after the reel table height confirmation is complated.



Reel Table Assembly Installation

Adjustment after Replacement

7. Reel Table Height Confirmation

Refer to Section 5-9-4.

8. Reel Brake Clearance Confirmation

Refer to Section 5-9-5.

9. Reel Brake Release Confirmation

Refer to Section 5-9-6.

5-23. Tape Guide Replacement

Note

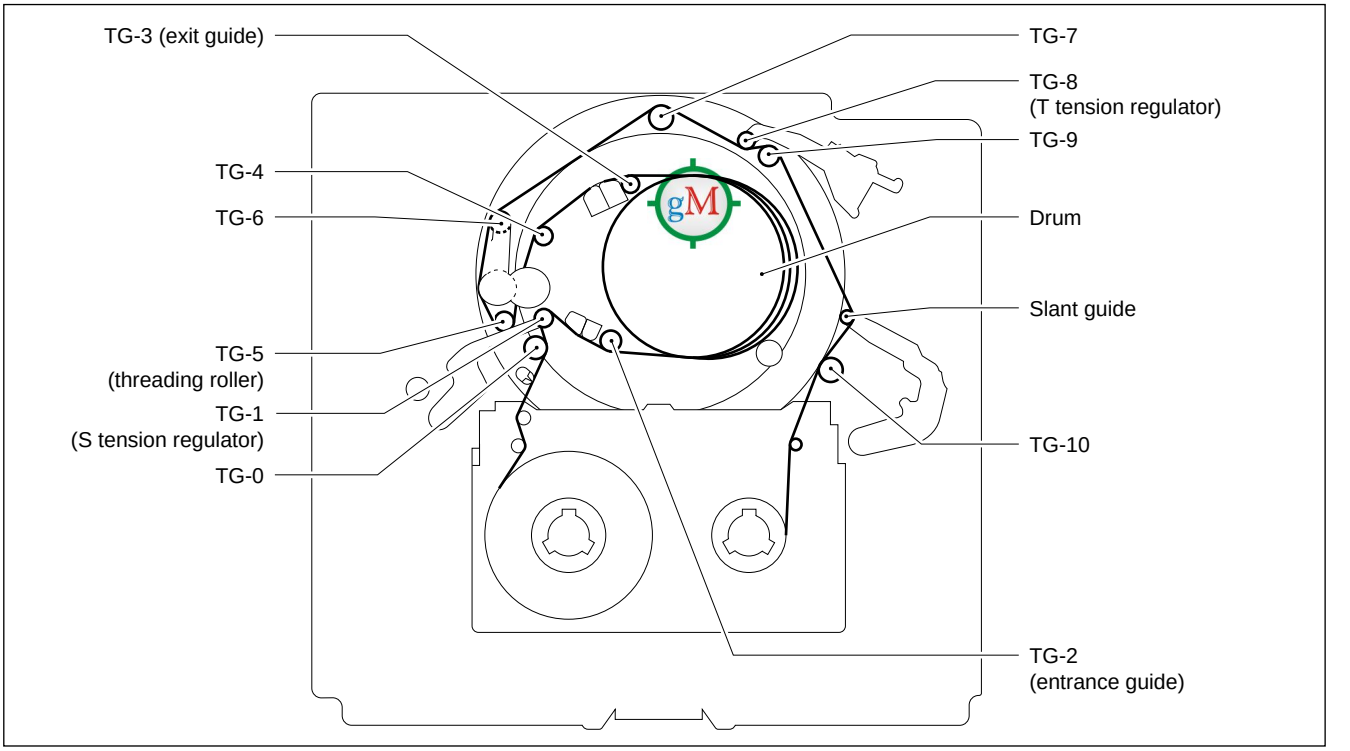
Be careful not to damage the drum when the tape guide roller is replaced.

Preparation

1. Turn off the power.
2. Remove the upper lid. (Refer to Section 2-3-1 in Maintenance Manual Part 1.)
3. Remove the plate MD assembly. (Refer to Section 2-4 in Maintenance Manual Part 1.)
4. Remove the cassette compartment assembly. (Refer to Section 2-5 in Maintenance Manual Part 1.)

Replacement

Perform the part replacement while referring to the exploded view.



Adjustment after Replacement

- Perform the following adjustments when any tape guide is replaced.
  ① Tape running adjustment
  (Refer to Section 7-1-2.)
  ② Video tracking confirmation
  (Refer to Section 7-1-3.)

- Perform the following adjustments when the slant guide is replaced.
  ① Slant guide slantness adjustment
  (Refer to Section 5-18-2.)
  ② Tape running adjustment
  (Refer to Section 7-1-2.)
  ③ Video tracking confirmation
  (Refer to Section 7-1-3.)

- Perform the following adjustments when the TG-2 or TG-3 tape guide is replaced.
  ① RF switching position adjustment
  (Refer to Section 4-2-7 in Maintenance Manual Part 1.)
  (A011: RF SWITCHING POS.)

5-24. Tape Cleaner Replacement

CAUTION

The tape cleaner has a sharp edge. Pay careful attention when handling the tape cleaner. Never touch it with bare hands.

Outline

Replacement

1. Tape Cleaner Removal
2. Tape Cleaner Installation

Note

The adjustment after tape cleaner replacement is not required.

Tools

- Torque screwdriver (6 kg • cm)(JB-5251): J-6252-510-A
- Torque screwdriver's bit (+2 mm, l = 75 mm): J-6323-420-A

Preparation

1. Turn off the power.
2. Remove the upper lid. (Refer to Section 2-3-1 in Maintenance Manual Part 1.)
3. Remove the plate MD assembly. (Refer to Section 2-4 in Maintenance Manual Part 1.)
4. Remove the cassette compartment assembly. (Refer to Section 2-5 in Maintenance Manual Part 1.)

Removal

1. Tape Cleaner Removal

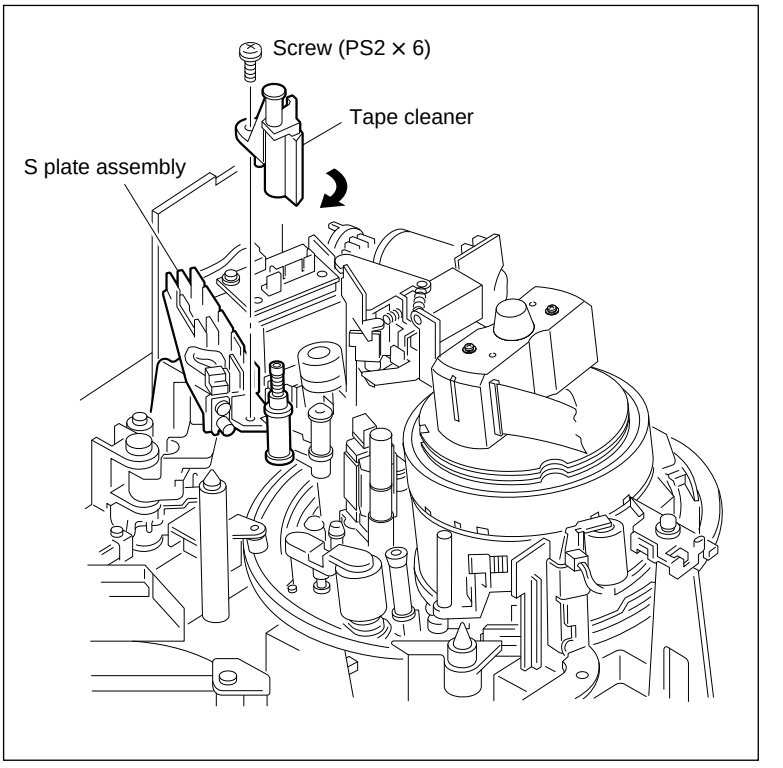
Remove the screw, then remove the tape cleaner from the S plate assembly.

Installation

2. Tape Cleaner Installation

Tighten the screw while moving a new tape cleaner clockwise.

Tightening torque: 19.6×10^{-2} N • m
{20 kgf • cm}



Tape Cleaner Removal/Installation

5-25. Full-erase Head Replacement

Outline

Replacement

1. Harnesses Disconnection
2. CTL/FE Head Assembly Removal
3. Full-erase Head Removal
4. Full-erase Head Installation
5. CTL/FE Head Assembly Installation
6. Harnesses Connection
7. Cleaning (Surfaces of Full-erase Head and CTL Head)

Adjustment after Replacement

8. Tape Running Adjustment (Refer to Section 7-1-2.)
9. CTL Head Height Confirmation (Refer to Section 7-1-4.)
10. CTL Head Position Adjustment (Refer to Section 7-1-5.)
11. Tape Running Confirmation (Refer to Section 7-1-2.)
12. AT Head Position Confirmation (Refer to Section 7-1-9.)
13. Drum Phase Adjustment (Refer to Section 6.)
14. Full-erase Current Confirmation (Refer to Section 3-11-4.)

Preparation

1. Turn off the power.
2. Remove the upper lid. (Refer to Section 2-3-1 in Maintenance Manual Part 1.)
3. Remove the plate MD assembly. (Refer to Section 2-4 in Maintenance Manual Part 1.)
4. Remove the cassette compartment assembly. (Refer to Section 2-5 in Maintenance Manual Part 1.)

Tools

- Cleaning cloth: 3-184-527-01
- Cleaning fluid: 9-919-573-01
- Torque screwdriver (6 kg • cm)(JB-5251): J-6252-510-A
- Torque screwdriver's bit (+2 mm, l = 75 mm): J-6323-430-A

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Removal

1. Harnesses Disconnection

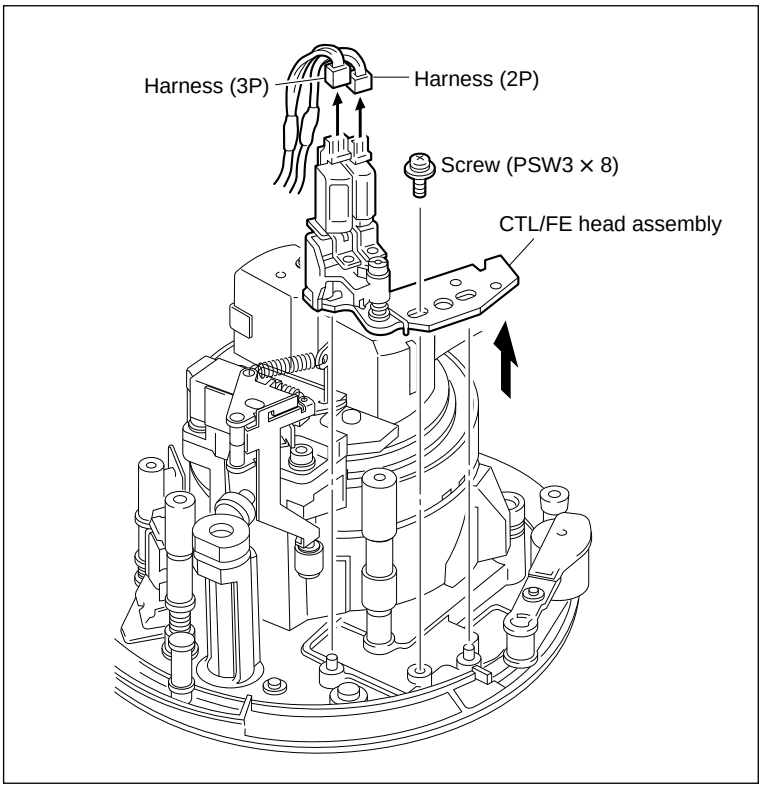
Disconnect the two harnesses from the connectors of the CTL/EE head assembly.

2. CTL/FE Head Assembly Removal

Remove the screw, then remove the CTL/FE head assembly.

Note

Be careful not to touch the drum (especially, video heads). Moreover, take care not to damage the peripheral tape guides.



CTL/FE Head Assembly Removal

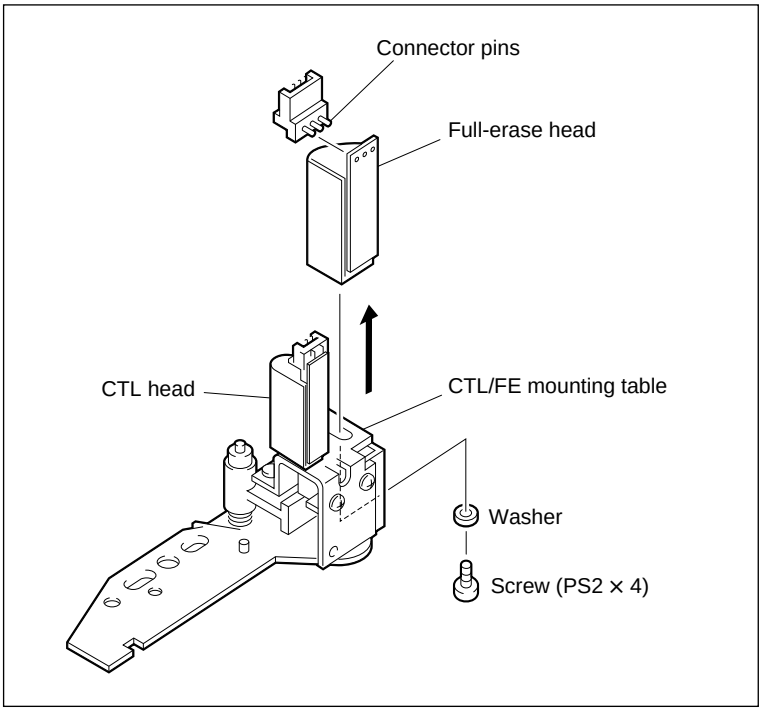
3. Full-erase Head Removal

(1) Remove the screw and washer, then remove the full-erase head.

Notes

- Be careful not to damage the CTL head when the full-erase head is removed.
- Do not loosen or remove the two screws fixing the CTL/FE mounting table. This causes the deviation in the zenith of the CTL head and full-erase head.

(2) Unsolder the connector pins.



Full-erase Head Removal

Installation

4. Full-erase Head Installation

(1) Solder the connector pins to a new full-erase head board.

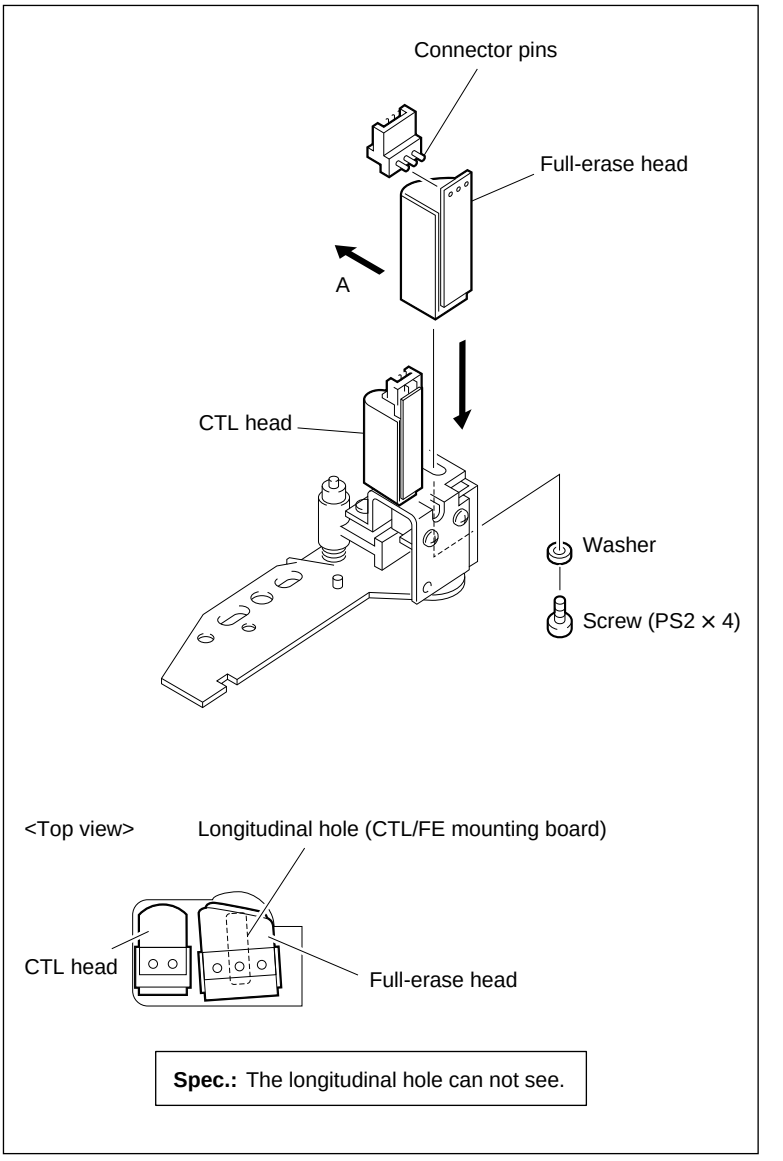
(2) Temporarily tighten the screw while moving the full-erase head in the direction indicated by arrow A.

Note

Be careful not to damage the full-erase head and CTL head.

(3) Confirm that the specification is satisfied, before tighten the screw.

Tightening torque: 19.6×10^{-2} N • m
{2.0 kgf • cm}



Full-erase Head Installation

5. CTL/FE Head Assembly Installation

(1) Confirm that the threading ring is in the unthreading end state.

(2) Put the sloted holes A and B of the CTL/FE head assembly into the bosses of the chassis.

Note

Be careful not to touch the drum (especially, video heads). Moreover, take care not to damage the peripheral tape guides.

(3) Place the boss of the chassis in the center of sloted hole A and tighten the screw.

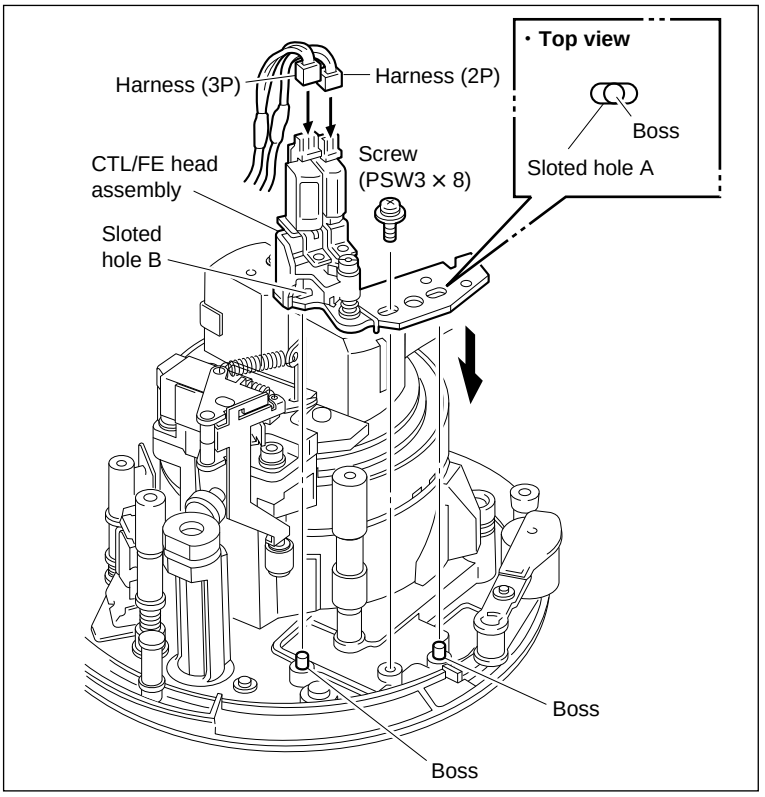
6. Harnesses Connection

Connect the two harnesses to the connectors of the CTL/EE head assembly.

7. Cleaning

Clean each surface of the CTL head and full-erase head using a cleaning cloth moistened with cleaning fluid.

(Refer to Section 5-2-5 in Maintenance Manual Part 1.)



CTL/FE Head Assembly Installation

Adjustment after Replacement

8. Tape Running Adjustment
Refer to Section 7-1-2.

9. CTL Head Height Confirmation
Refer to Section 7-1-4.

10. CTL Head Position Adjustment
Refer to Section 7-1-5.

11. Tape Running Confirmation
Refer to Section 7-1-2.

12. AT Head Position Confirmation
Refer to Section 7-1-9.

13. Drum Phase Adjustment
Refer to Section 6-2-1.

14. Full-erase Current Confirmation
Refer to Section 3-11-4.

5-26. Cleaning Solenoid Replacement

Perform this section when the former video head cleaner assembly is used.

When the VTR has been using the improved video head cleaner assembly, it is impossible to make a replacement of solenoid alone. When replacing the solenoid, be sure to replace the whole video head cleaner assembly.
(Refer to Section 5-4.)

Outline

Replacement

1. Harness Disconnection (CN851/PD-35 Board)
2. Video Head Cleaner Assembly Removal
3. Cleaning Solenoid Removal
4. Cleaning Solenoid Installation
5. Video Head Cleaner Assembly Installation
6. Cleaning Roller Position Adjustment
7. Harness Connection (CN851/PD-35 Board)

Adjustment after Replacement

8. Cleaning Solenoid Operation Confirmation (Refer to Section 4-2-2 in Maintenancs Manual Part 1.)
   (C023: CLEANING ROLLER)

Preparation

1. Turn off the power.
2. Remove the upper lid. (Refer to Section 2-3-1 in Maintenance Manual Part 1.)
3. Remove the plate MD assembly. (Refer to Section 2-4 in Maintenance Manual Part 1.)
4. Remove the cassette compartment assembly. (Refer to Section 2-5 in Maintenance Manual Part 1.)

Tools

- Torque screwdriver (6 kg • cm)(JB-5251): J-6252-510-A
- Torque screwdriver's hexagonal bit
  (Across flat has 1.5 mm, l = 50 mm): J-6323-440-A
- Locking compound: 7-432-114-11

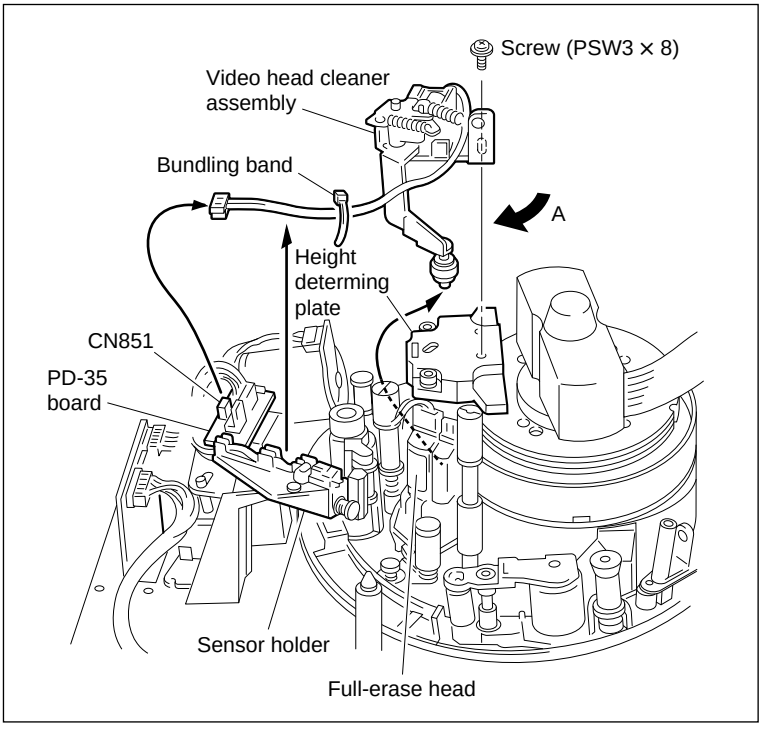
Removal

1. Harness Disconnection

(1) Disconnect the harness from the connector CN851 on the PD-35 board.
(2) Cut off the bundling band.
(3) Remove the harness from the sensor holder.

2. Video Head Cleaner Assembly Removal

(1) Remove the screw.
(2) Remove the video head cleaner assembly from the height determing plate while rotating it in the direction indicated by arrow A.



Video Head Cleaner Assembly Removal

3. Cleaning Solenoid Removal

(1) Remove the two screws and washers, then remove the shield case containing a solenoid.
(2) Take out the solenoid from the shield case.
(3) Remove the CL washer from the iron core of the solenoid.

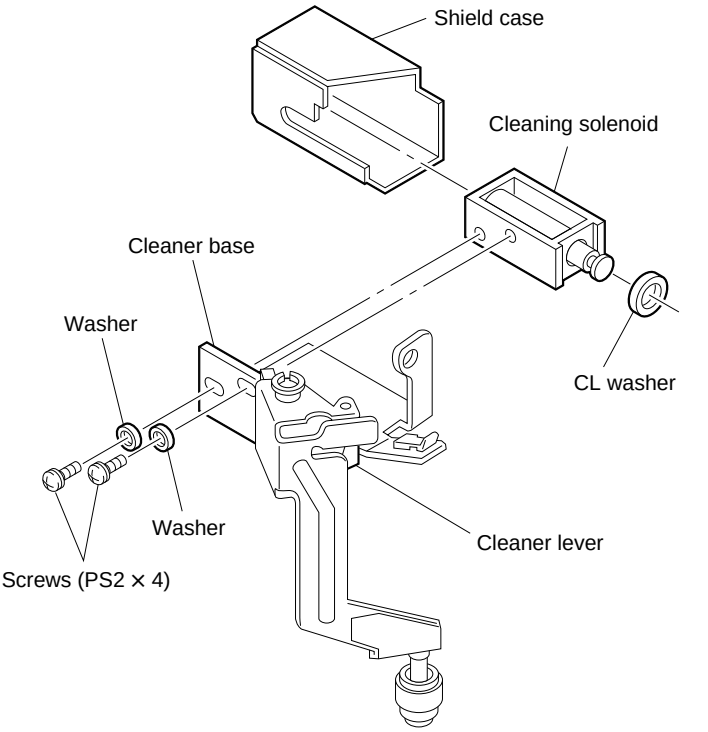
Installation

4. Cleaning Solenoid Installation

(1) Pass the CL washer through the iron core of a new solenoid.
(2) Align the solenoid with the hole of the cleaner base while putting the groove of the iron core between the pins of the cleaner lever and temporarily tighten the two screws.
(3) Put the shield case in the direction shown in the figure and insert it between the cleaner base and solenoid.
(4) Adjust the solenoid position so that the clearance between the cleaner lever and cleaner base is 1 mm with the iron core pushed in the direction of the arrow and tighten the two screws.

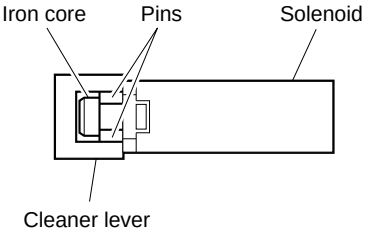
Tightening torque: 19.6×10^{-2} N • m
{2.0 kgf • cm}

(5) Slightly apply locking compound to the screws.
(6) Put the harness in the harness clamper.

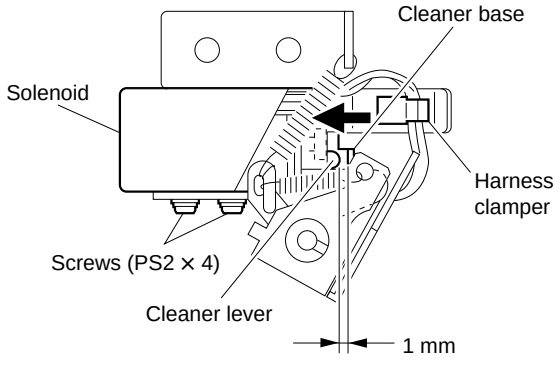


• Cautions during installation

Step 4-(2)



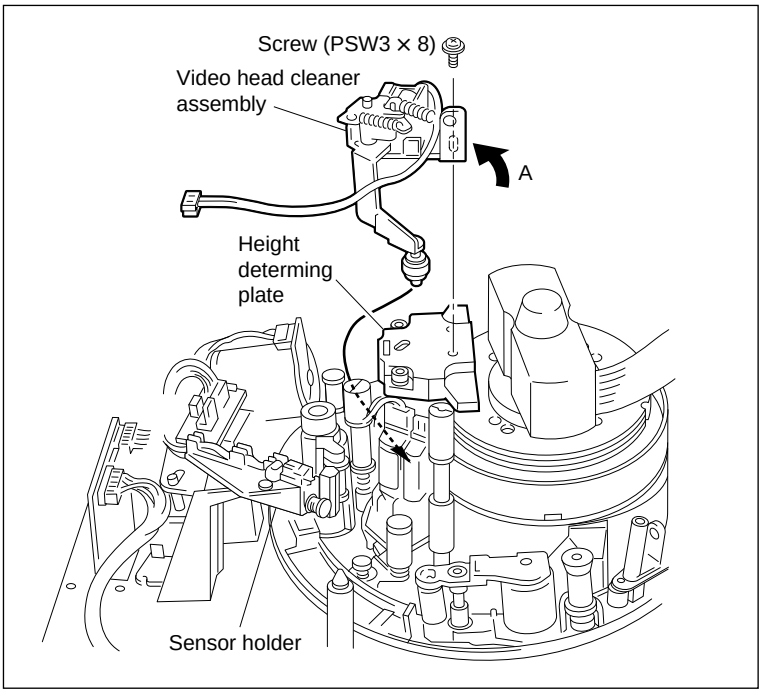
Step 4-(4)



Cleaning Solenoid Removal/Installation

5. Video Head Cleaner Assembly Installation

(1) Insert the cleaning roller into the clearance between the height determing plate and full-erase head as shown in the figure.
(2) Align the two pins of the video head cleaner assembly with the two holes of the height determing plate.
(3) Tighten the screw while pushing the video head cleaner assembly in the direction indicated by arrow A.



Video Head Cleaner Assembly Installation

6. Cleaning Roller Position Adjustment

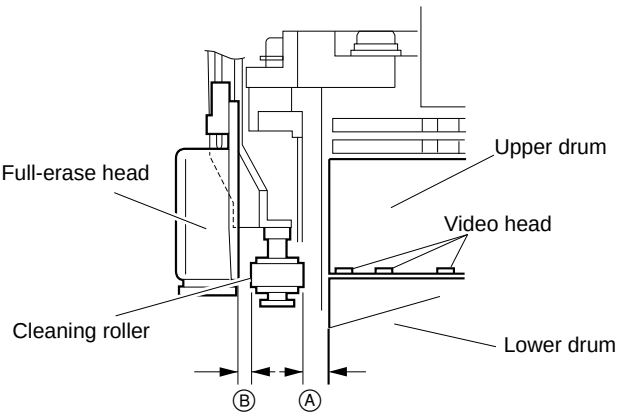
(1) Confirm visually that the cleaning roller does not touch the upper drum. (Specification 1)

If the cleaning roller touches the upper drum, bend portion B of the video head cleaner sub-assembly in the direction indicated by arrow C with portion A as a supporting point.

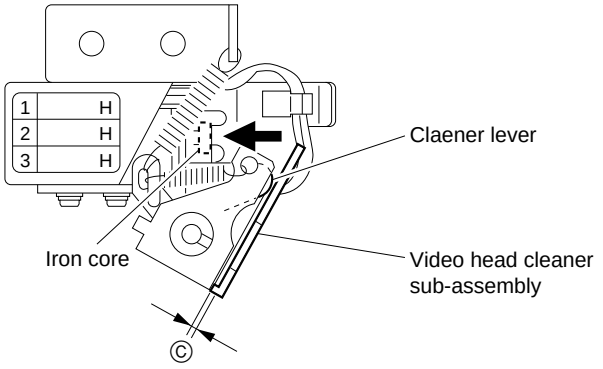
(2) Similarly, confirm visually that the cleaning roller does not touch the terminal of the full-erase head. (Specification 2)

If the cleaning roller touches the terminal of the full-erase head, bend portion B of the video head cleaner sub-assembly in the direction indicated by arrow D with portion A as a supporting point.

(3) Push the iron core of the solenoid in the direction indicated by the arrow. At that time, confirm that a clearance exists between the cleaner lever and video head cleaner sub-assembly. (Specification 3)

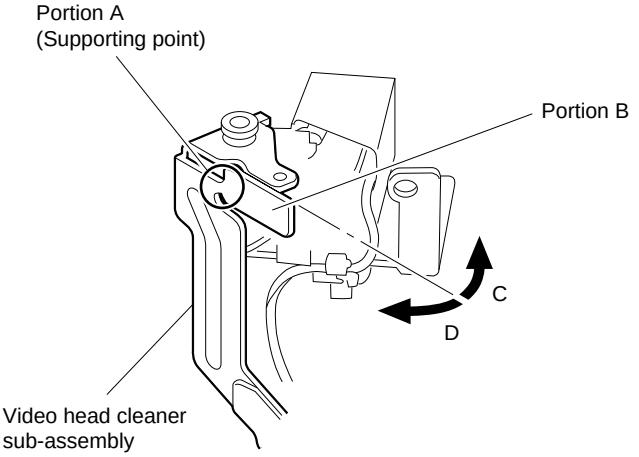


Spec.1: Ⓐ = Clearance exists
Spec.2: Ⓑ = Clearance exists



Spec. 3: Ⓒ = Clearance exists

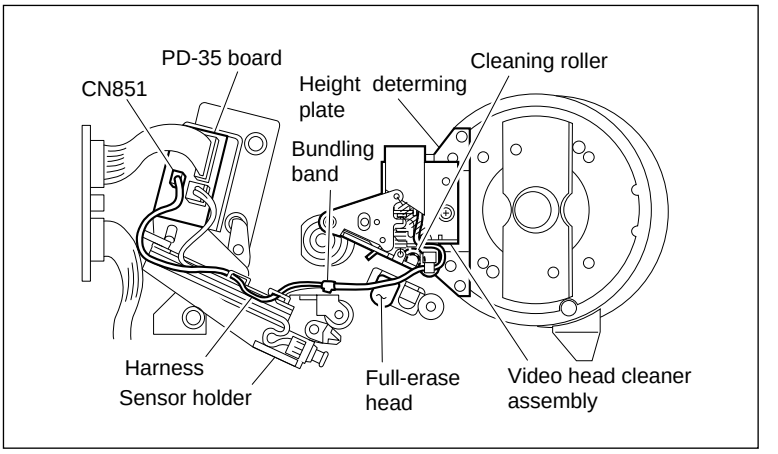
・Specifications are not satisfied.



Cleaning Roller Position Adjustment

7. Harness Connection

(1) Fix the harness to the position of the sensor holder shown in the figure.
(2) Connect the harness to the connector CN851 on the PD-35 board.
(3) Fix the two harnesses of the full-erase head and video head cleaner assembly with a new bundling band (or the equivalent).



Harness Connection

Adjustment after Replacement

8. Cleaning Solenoid Operation Confirmation

Refer to Section 4-2-2 in Maintenance Manual Part 1.
(C023: CLEANING ROLLER)

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5-27. Reel Shift Gear Replacement

Outline

Replacement

1. RS Table Block Assembly Removal (Refer to steps 1 through 3 in Section 5-9-1.)
2. Reel Shift Gear Removal
3. Crank Gear Removal
4. Crank Gear Installation
5. Reel Shift Gear Installation
6. Grease Applying (Warm Gear)
7. RS Table Block Assembly Installation (Refer to steps 9 through 13 in Section 5-9-1.)
8. Reel Shift Gear Operation Confirmation

Adjustment after Replacement

9. Cassette Pillar Height Adjustment (Refer to Section 5-9-3.)

Notes

- This section describes the reel shift gear replacement. The replacement of the warm wheel, crank gear, and crank arm is also the same as for this replacement procedure.
- The steps 3 and 4 are not required when the reel shift gear or warm wheel is replaced.
- Use a new stop washer when the reel shift gear, warm wheel, crank gear, and crank arm are replaced.
  Stop washer (2.3): 3-669-596-00

Preparation

1. Turn off the power.
2. Remove the upper lid. (Refer to Section 2-3-1 in Maintenance Manual Part 1.)
3. Remove the plate MD assembly. (Refer to Section 2-4 in Maintenance Manual Part 1.)
4. Remove the cassette compartment assembly. (Refer to Section 2-5 in Maintenance Manual Part 1.)

Tools

- Oil: 7-661-018-18
- Grease (SGL-601): 7-651-000-10
- Cleaning fluid: 9-919-573-01
- Cleaning cloth: 3-184-527-01

Removal

1. RS Table Block Assembly Removal

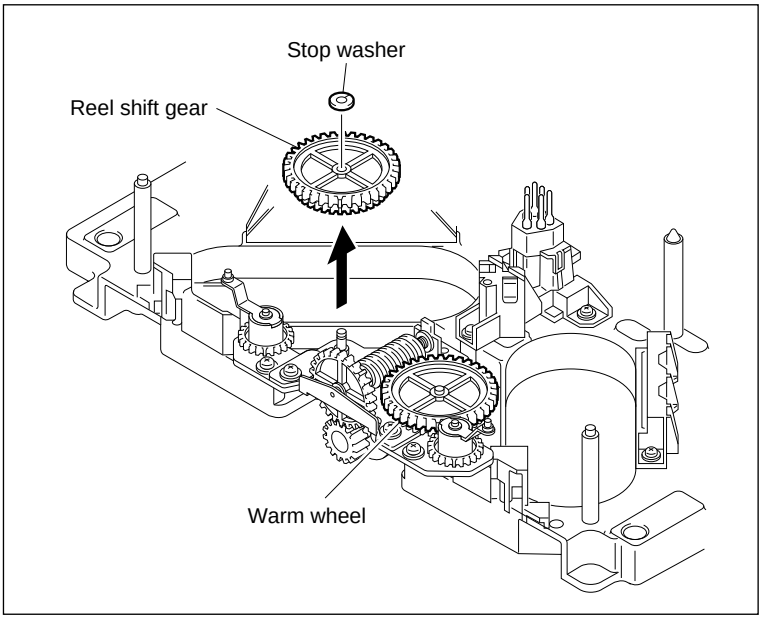
Remove the RS table block assembly with the reel table assembly attached.
(Refer to steps 1 through 3 in Section 5-9-1.)

2. Reel Shift Gear Removal

Remove the stop washer, then remove the reel shift gear.

Note

Do not reuse the stop washer.



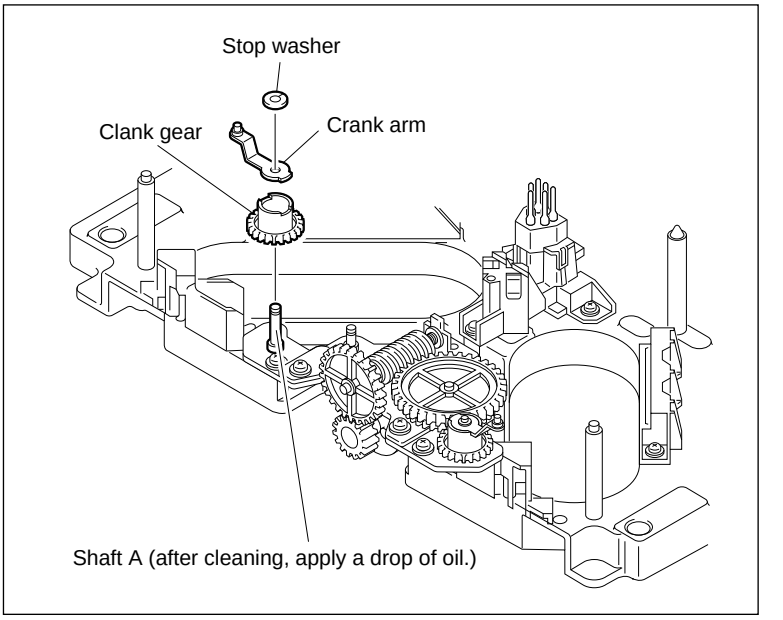
Reel Shift Gear Removal

3. Crank Gear Removal

(1) Remove the stop washer, then remove the crank gear.
(2) Take out the crank arm from the crank gear.

Note

Do not reuse the stop washer.



Crank Gear Removal/Installation

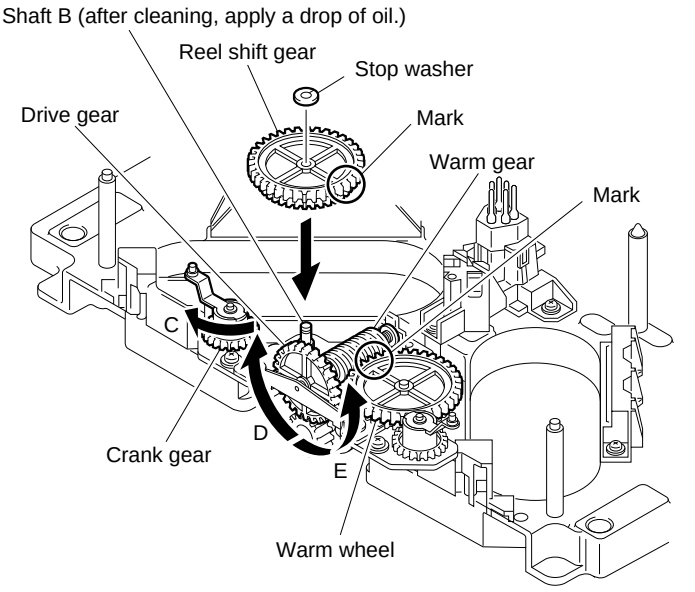
Installation

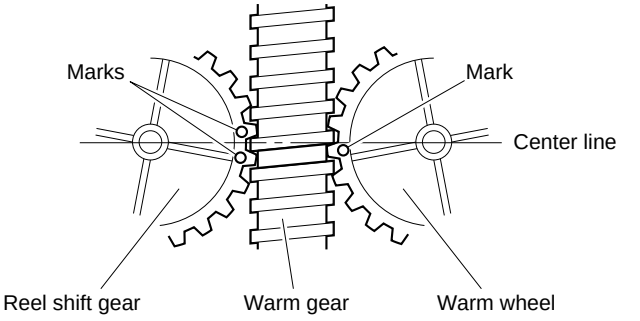
4. Crank Gear Installation

(1) Clean shaft A.
(2) Apply one drop of oil to shaft A.
(3) Combine the crank arm with the crank gear.
(4) Pass the crank gear through the shaft A.
(5) Fix the crank gear with a new stop washer.

5. Reel Shift Gear Installation

(1) Clean shaft B.
(2) Apply one drop of oil to shaft B.
(3) Turn the crank gear fully in the direction indicated by arrow C.
(4) Turn the drive gear and put the mark of the warm wheel in the illustrated position.
(5) Align the mark of the reel shift gear with that of the warm wheel and pass the reel shift gear through shaft B while engaging it with the warm gear and crank gear.
(6) Rotate the drive gear in the direction indicated by arrow D by three to five turns, then fully rotate it in the direction of arrow E. At that time, confirm that the reel shift gear and warm wheel satisfy the specification.
(7) Fix the reel shift gear with a new stop washer.





Spec. : The mark of the reel shift gear and the mark of the warm wheel are in the portion shown in the figure.

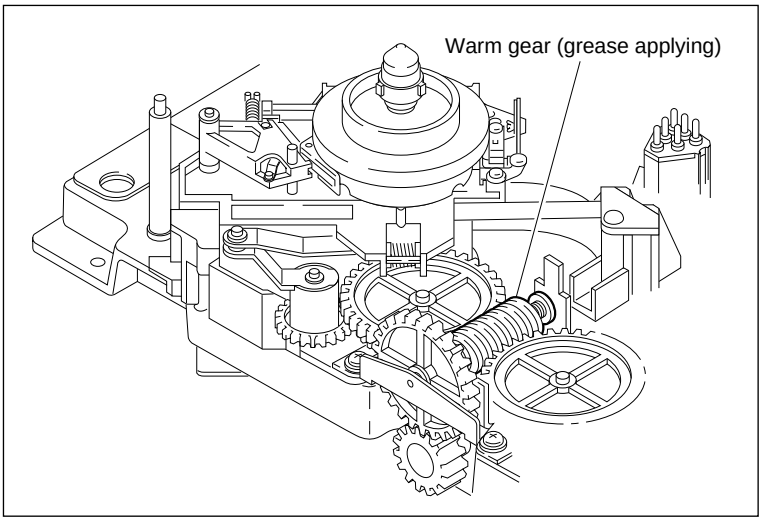
Reel Shift Gear Installation

6. Grease Applying

(1) Wipe the grease on the warm gear and clean it.
(2) Apply grease to the warm gear.

7. RS Table Block Assembly Installation

Refer to steps 9 through 13 in Section 5-9-1.



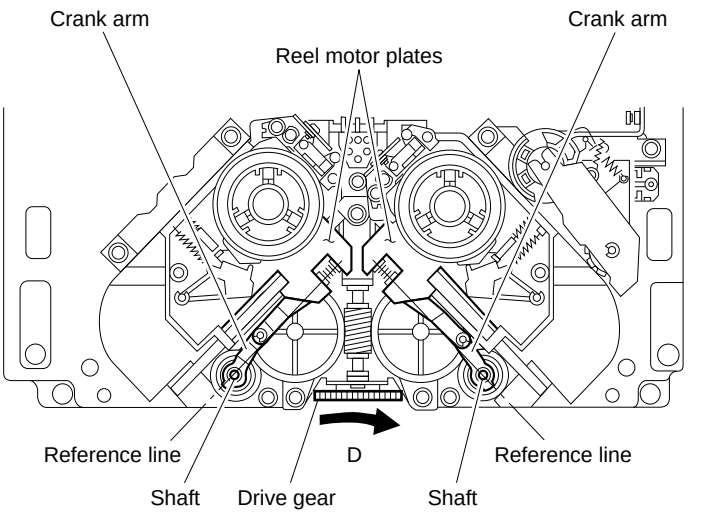
Grease Applying

8. Reel Shift Gear Operation Confirmation

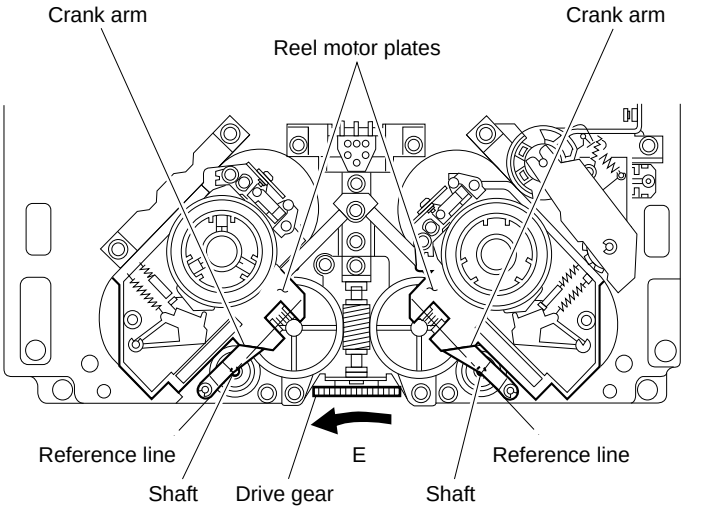
(1) Confirm that the crank arms on the supply and take-up sides operate in the same phase while turning the drive gear in the directions indicated by arrows D and E.

(2) Confirm that the crank arm is nearer to the reel motor plate than the reference line when the drive gear is rotated in the direction indicated by arrow D until it stops. (Fig. A) Similarly, confirm that the crank arm is nearer to the reel motor plate than the reference line when the drive gear is rotated in the direction indicated by arrow E until it stops. (Fig. B)

<Fig. A>



<Fig. B>



Reel Shift Gear Operation Confirmation

Adjustment after Replacement

9. Cassette Pillar Height Adjustment

Refer to Section 5-9-3.

5-28. Reel Shift Motor Replacement

Outline

Replacement

1. RS Table Block Assembly Removal (Refer to Procedures 1 through 3 in Section 5-9-1.)
2. Reel Shift Assembly Removal
3. M Gear Removal
4. Reel Shift Motor Removal
5. CCM-15 Board Removal
6. CCM-15 Board Mounting
7. Reel Shift Motor Installation
8. M Gear Installation
9. Reel Shift Assembly Installation
10. Grease Applying (Warm Gear)
11. RS Table Block Assembly Installation (Refer to steps 9 through 13 in Section 5-9-1.)

Adjustment after Replacement

12. Cassette Pillar Height Adjustment (Refer to Section 5-9-3.)
13. Reel Shift Motor Operation Check (Refer to Section 4-2-2 in Maintenance Manual Part 1.)
    (C016: REEL SHIFT MOTOR)

Notes

1. Turn off the power.
2. Remove the upper lid. (Refer to Section 2-3-1 in Maintenance Manual Part 1.)
3. Remove the plate MD assembly. (Refer to Section 2-4 in Maintenance Manual Part 1.)
4. Remove the cassette compartment assembly. (Refer to Section 2-5 in Maintenance Manual Part 1.)

Tools

- L wrench (Across flat has 0.89 mm): 7-700-736-06
- Torque screwdriver (6 kg • cm)(JB-5251): J-6252-510-A
- Torque screwdriver's hexagonal bit (Across flat has 0.89 mm, l = 50 mm): J-6323-440-A
- Thickness gauge: 9-911-053-00
- Grease (SGL-601): 7-651-000-10
- Oil: 7-661-018-18
- Locking compound : 7-432-114-11
- Cleaning fluid: 9-919-573-01
- Cleaning cloth: 3-184-527-01

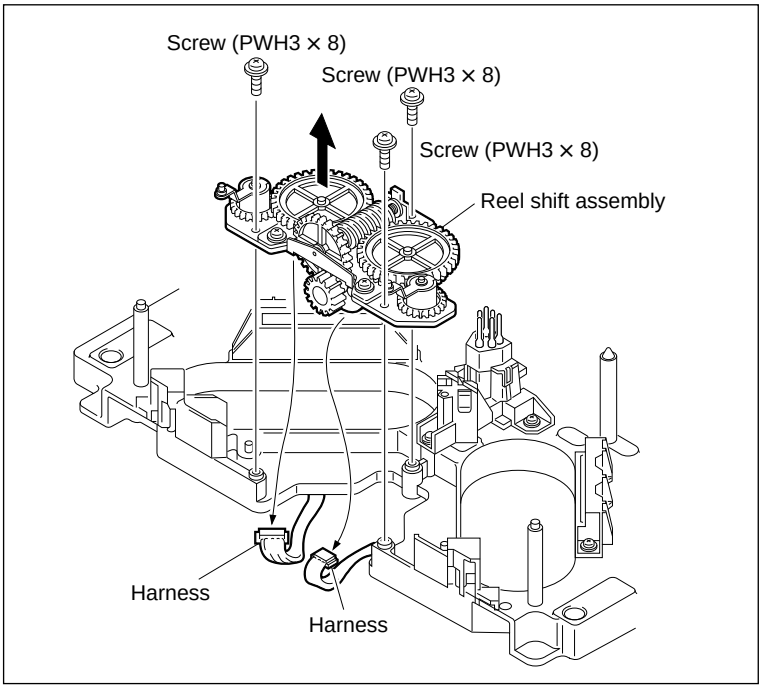
Removal

1. RS Table Block Assembly Removal

Remove the RS table block assembly on the supply and take-up sides with the reel table assembly attached. (Refer to procedures 1 through 3 in Section 5-9-1.)

2. Reel Shift Assembly Removal

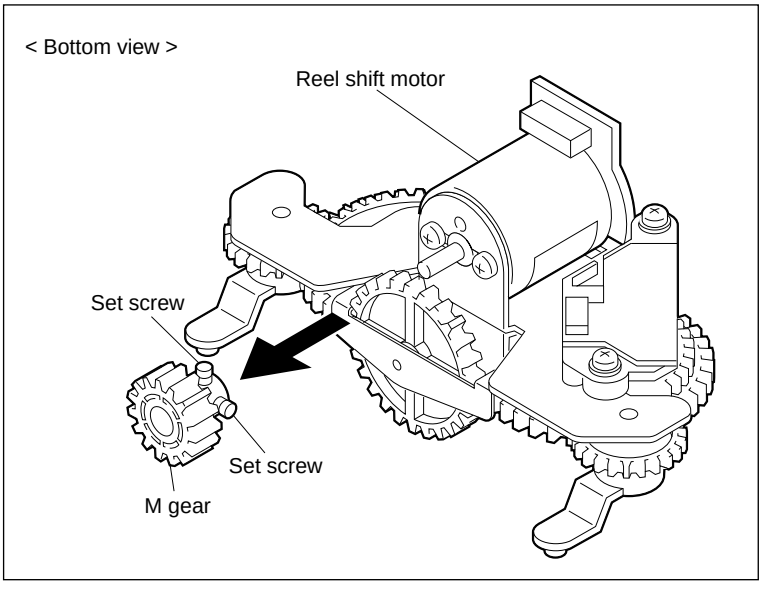
(1) Remove the three screws.
(2) Raise the reel shift assembly and disconnect the two harnesses shown in the figure.



Reel Shift Assembly Removal

3. M Gear Removal

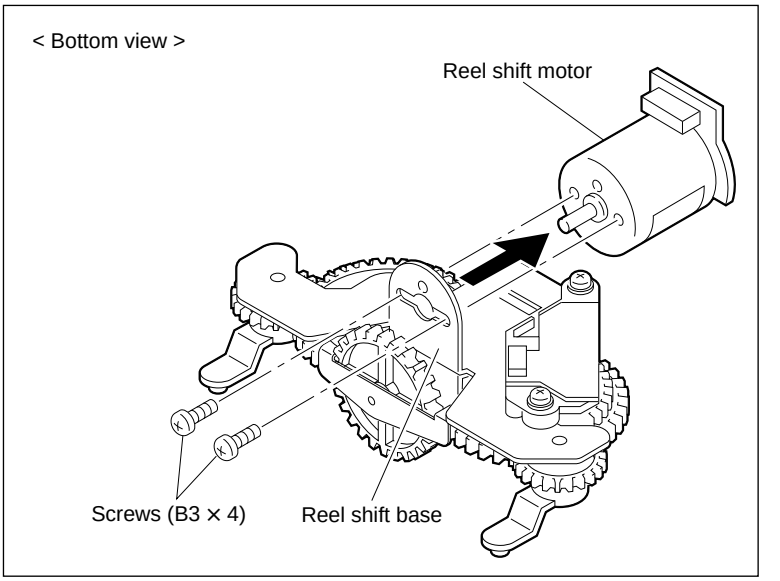
(1) Loosen the two set screws shown in the figure.
(2) Pull out the M gear from the shaft.



M Gear Removal

4. Reel Shift Motor Removal

Remove the two screws, then remove the reel shift motor from the reel shift base.



Reel Shift Motor Removal

5. CCM-15 Board Removal

Unsolder and remove the CCM-15 board from the reel shift motor.

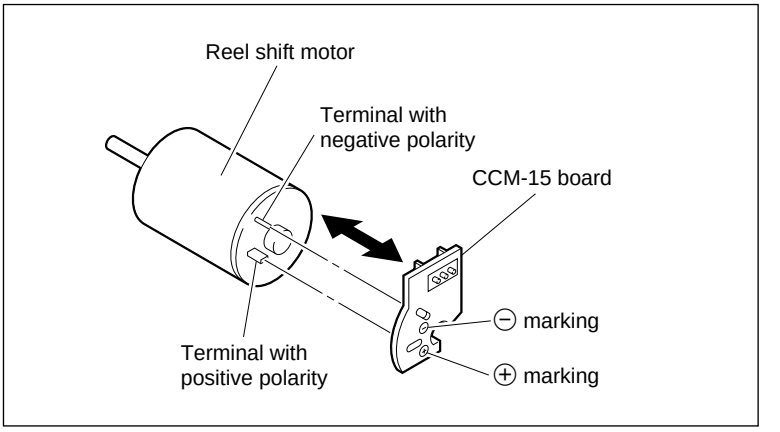
Installation

6. CCM-15 Board Mounting

Pass the terminals of a new motor through the CCM-15 board, then solder.

Note

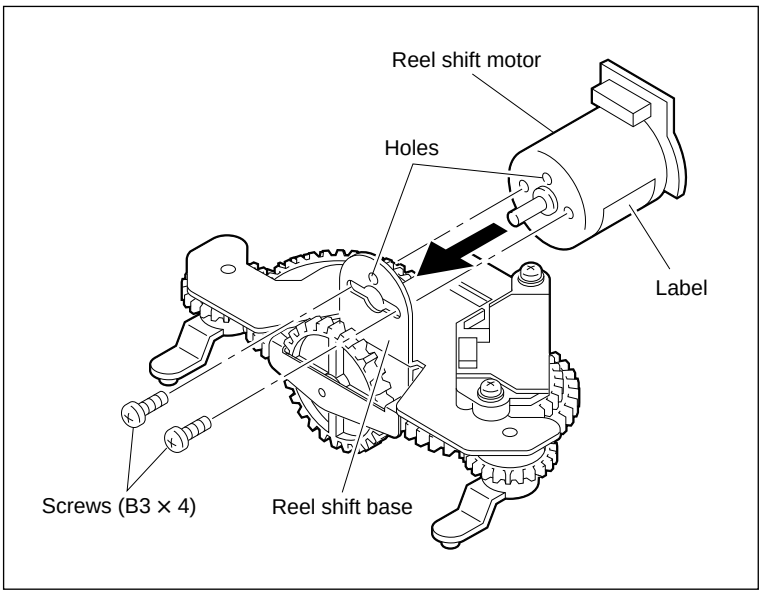
Solder so that no clearance exists between the motor and CM-15 board.



CCM-15 Board Removal/Mounting

7. Reel Shift Motor Installation

(1) Align the position of the reference hole of the motor with that of the reel shift base and tighten the two screws.
(2) Slightly apply locking compound to the screws.



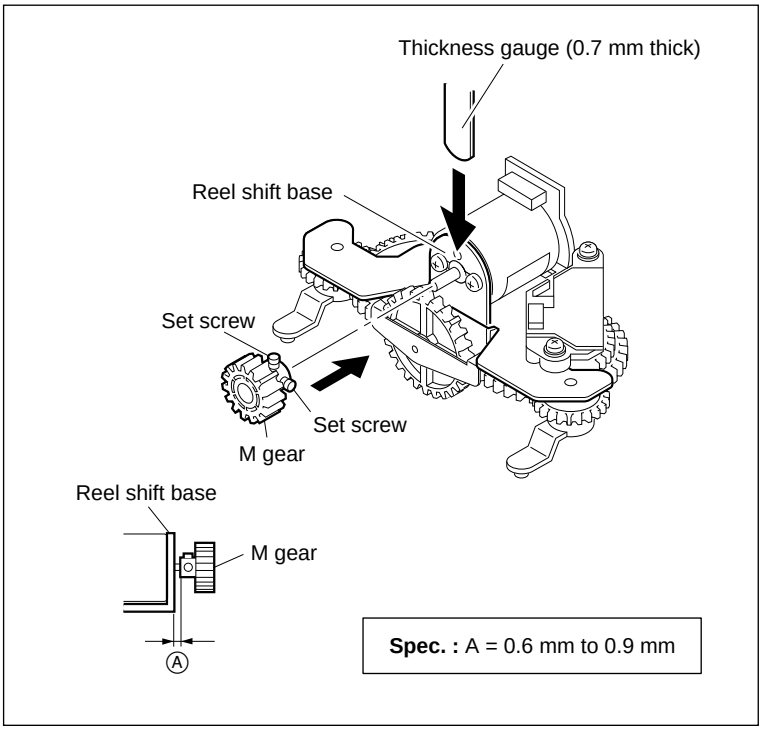
Reel Shift Motor Installation

8. M Gear Installation

(1) Pass the M gear through the shaft of the motor.
(2) Put a thickness gauge (0.7 mm thick) between the M gear and reel shift base.
(3) Tighten the two set screws while pushing the M gear toward the reel shift base.

Tightening torque: 18.6×10^{-2} N • m
{1.9 kgf • cm}

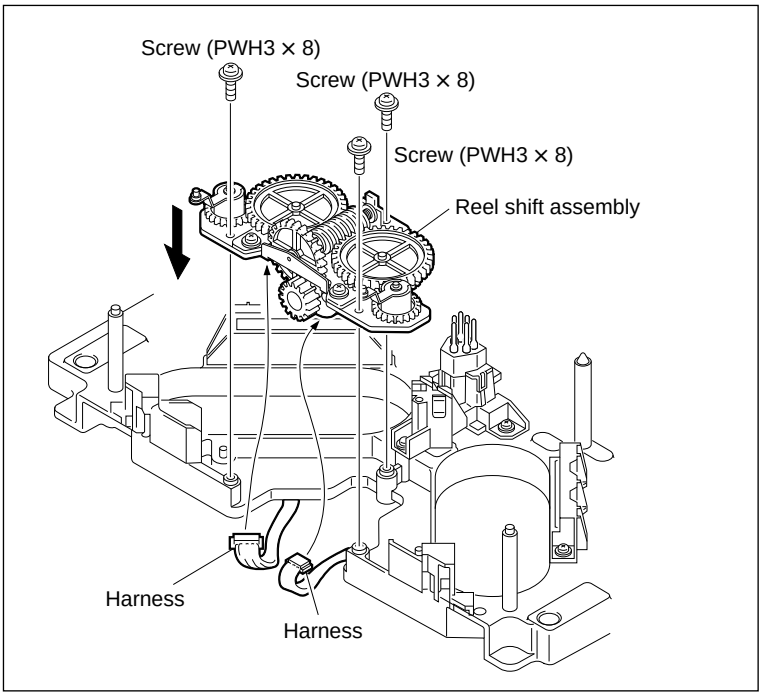
(4) Pull out the thickness gauge.
(5) Confirm that the clearance between the M gear and reel shift base satisfies the specification when the M gear is pushed toward the reel shift base.



M Gear Installation

9. Reel Shift Assembly Installation

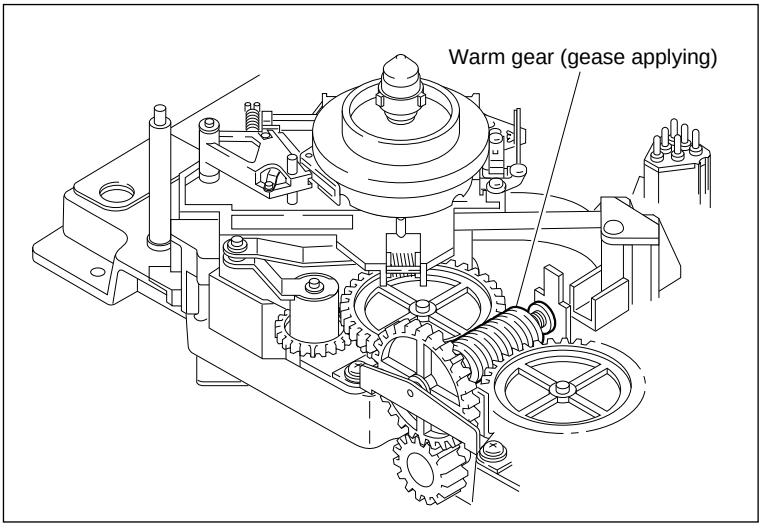
(1) Connect the two harnesses disconnected in step 2 to the reel shift assembly.
(2) Tighten the three screws.



Reel Shift Assembly Installation

10. Grease Applying

(1) Wipe the grease on the warm gear and clean it.
(2) Apply grease to the warm gear.



Grease Applying

11. RS Table Block Assembly Installation

Refer to steps 9 through 13 in Section 5-9-1.

Adjustment after Replacement

12. Cassette Pillar Height Confirmation

Refer to Section 5-9-3.

13. Reel Shift Motor Operation Check

Refer to Section 4-2-2 in Maintenance Manual Part 1.
(C016: REEL SHIFT MOTOR)

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5-29. Cassette Compartment Motor Replacement

Outline

Replacement

1. Harness Disconnection (CN935/CL-29 Board)
2. Warm Removal
3. Cassette Compartment Motor Removal
4. Motor Joint Removal
5. Spacer Removal and Harness Disconnection
6. Harness Soldering
7. Motor Joint Installation
8. Spacer and Warm Installation
9. Cassette Compartment Motor Installation
10. Grease Applying
11. Harness Connection (CN935/CL-29 Board)

Adjustment after Replacement

12. Cassette Compartment Motor Operation Check (Refer to Section 4-2-2 in Maintenance Manual Part 1.)
    (C013: CASSETTE COMP.)

Preparation

1. Turn off the power.
2. Remove the upper lid. (Refer to Section 2-3-1 in Maintenance Manual Part 1.)
3. Remove the plate MD assembly. (Refer to Section 2-4 in Maintenance Manual Part 1.)
4. Remove the cassette compartment assembly. (Refer to Section 2-5 in Maintenance Manual Part 1.)

Tools

- L wrench (Across flat has 0.89 mm): 7-700-736-06
- Grease (SGL-601): 7-651-000-10
- Cleaning cloth: 3-184-527-01
- Cleaning fluid: 9-919-573-01
- Calipers (or the equivalent)

Removal

1. Harness Disconnection

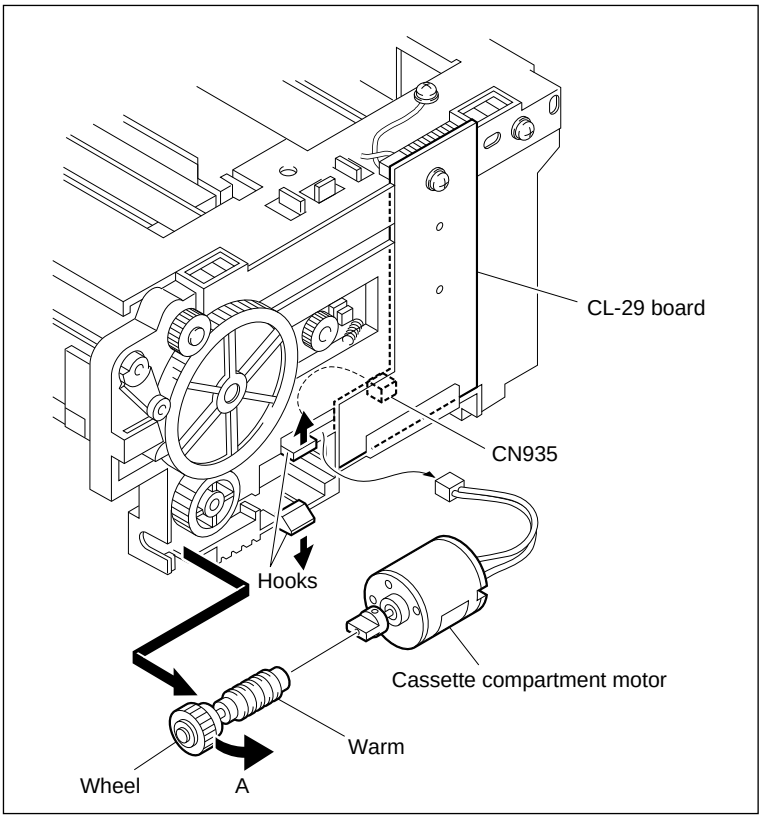
Disconnect the harness from the connector CN935 on the CL-29 board.

2. Warm Removal

Push the wheel in the direction indicated by arrow A and take out the warm.

3. Cassette Compartment Motor Removal

Spread the hooks of the chassis and push out the cassette compartment motor from the inside of the cassette compartment.



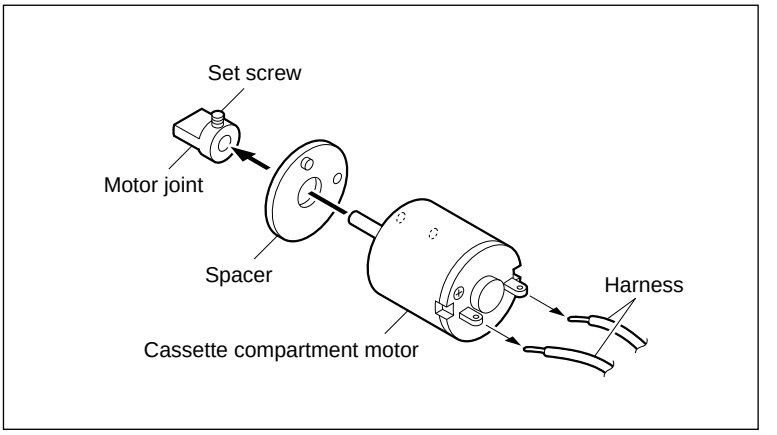
Cassette Compartment Motor Removal (1)

4. Motor Joint Removal

Loosen the set screw by two to three turns and remove the motor joint.

5. Spacer Removal and Harness Disconnection

(1) Remove the spacer.
(2) Unsolder and disconnect the harness from the motor.



Cassette Compartment Motor Removal (2)

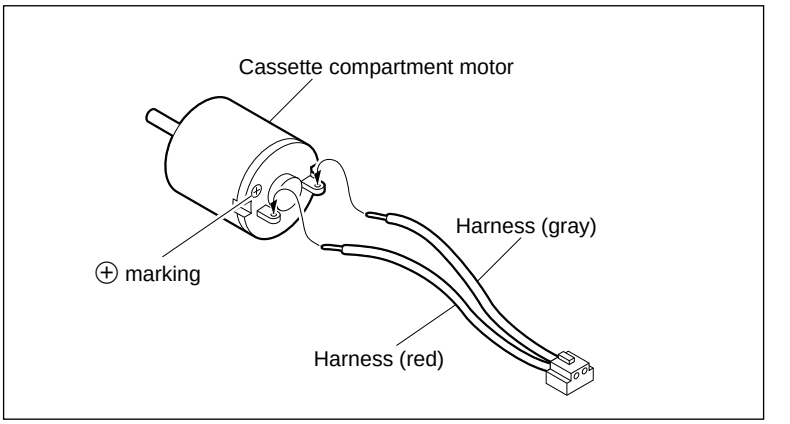
Installation

6. Harness Soldering

Solder the harness disconnected in (2) of step 5 to a new motor.

Note

Solder a red harness to marking "+" of the motor.



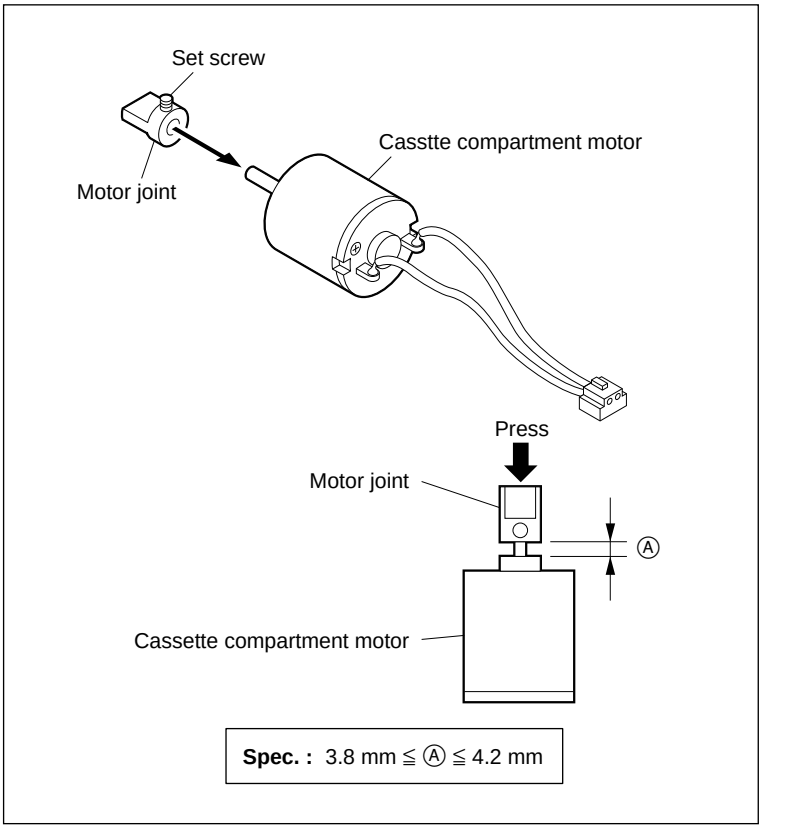
Harness Soldering

7. Motor Joint Installation

(1) Pass the motor joint through the shaft of the motor and temporarily tighten the set screw.

(2) Confirm that the clearance between the motor joint and motor satisfies the specification when the motor joint is pushed toward the motor and tighten the set screw.

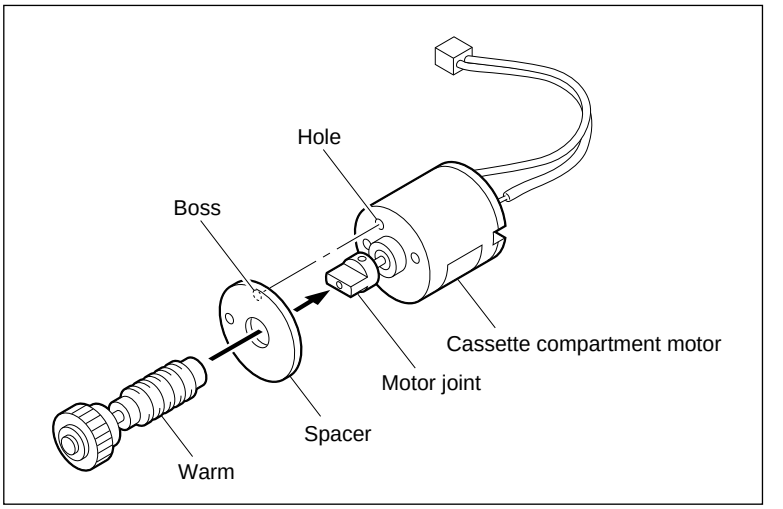
Tightening torque: 60×10^{-2} N • m
{6 kgf • cm}



Motor Joint Installation

8. Spacer and Warm Installation

(1) Put the boss of the spacer in the hole of the motor.
(2) Align the warm with the motor joint, then insert it.



Spacer and Warm Installation

9. Cassette Compartment Motor Installation

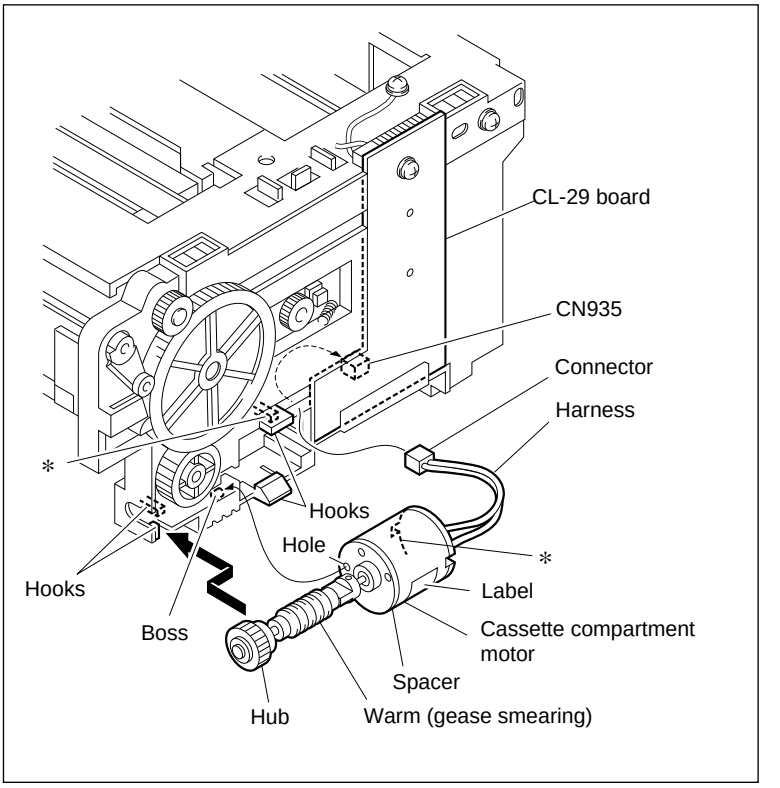
(1) Put the motor in the direction shown in the figure and pass the harness through the hole of the chassis.
(2) Place the ⁎-marked portion of the motor shown in the figure and put the motor in the two hooks while inserting the hole of the spacer into the boss of the chassis. Simultaneously, put the hub of the warm in the two hooks of the chassis.
(3) Confirm that the motor has been fixed.

10. Grease Smearing

(1) Wipe the grease on the warm and clean it.
(2) Slightly apply grease to the warm.

11. Harness Connection

Connect the harness of the cassette comportment motor to connector CN935 on the CL-29 board.



Cassette Compartment Motor Installation

Adjustment after Replacement

12. Cassette Compartment Motor Operation Check

Refer to Section 4-2-2 in Maintenance Manual Part 1.
(C013: CASSETTE COMP.)

Note

Perform this check with the cassette compartment installed in the unit.

5-30. Power Supply Block Replacement

Outline

Replacement

1. Bottom Plate Removal
2. Harnesses Disconnection
3. Power Supply Panel Assembly Removal
4. Power Supply Block Removal
5. Power Supply Block Installation
6. Power Supply Panel Assembly Installation
7. Harnesses Connection
8. Bottom Plate Installation
9. Operation Confirmation

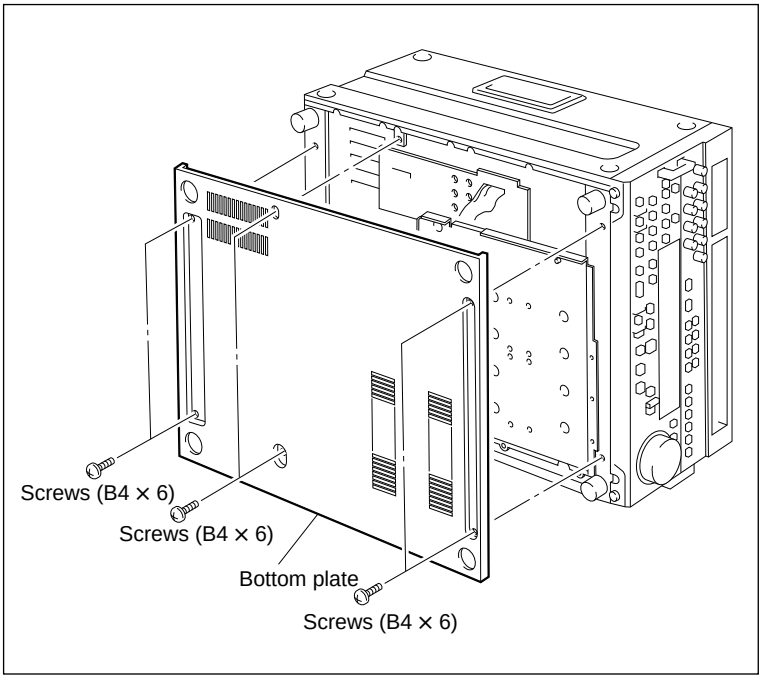
Preparation

1. Turn the power off and then wait over 30 seconds.
2. Remove the power supply cord plug from the outlet.

Removal

1. Bottom Plate Removal

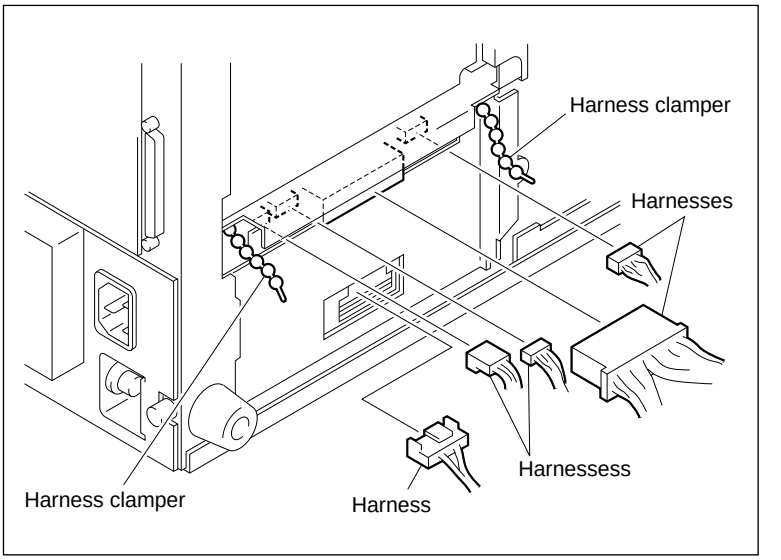
(1) Place the unit on its right side panel down.
(2) Remove the six screws and remove the bottom plate.



Remove the Bottom Plate

2. Harnesses Disconnection

(1) Release the two harness clampers as shown in the figure.
(2) Disconnect the five harnesses.



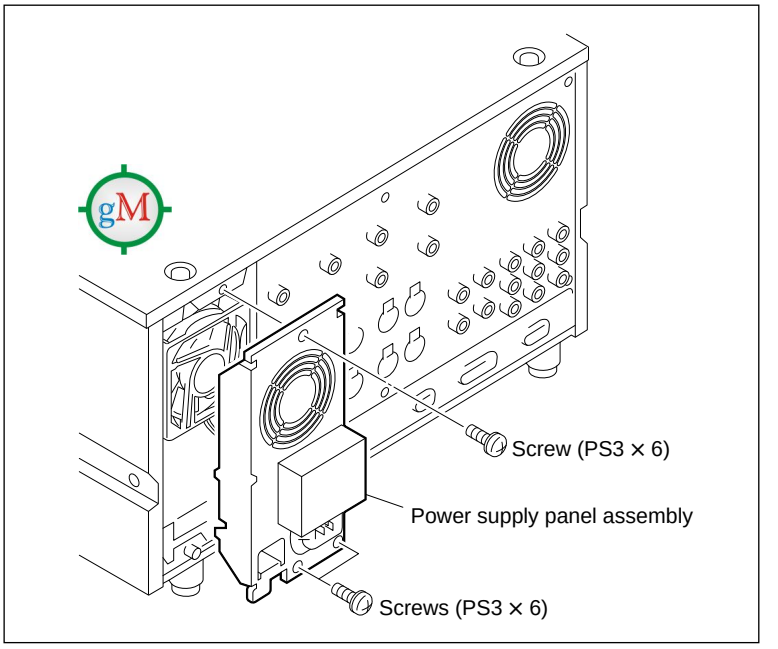
Harnesses Disconnection

3. Power Supply Panel Assembly Removal

Remove the three screws and open the power supply panel assembly.

Note

It is not necessary to disconnect the harness connected to the power supply panel assembly.



Power Supply Panel Assembly Removal

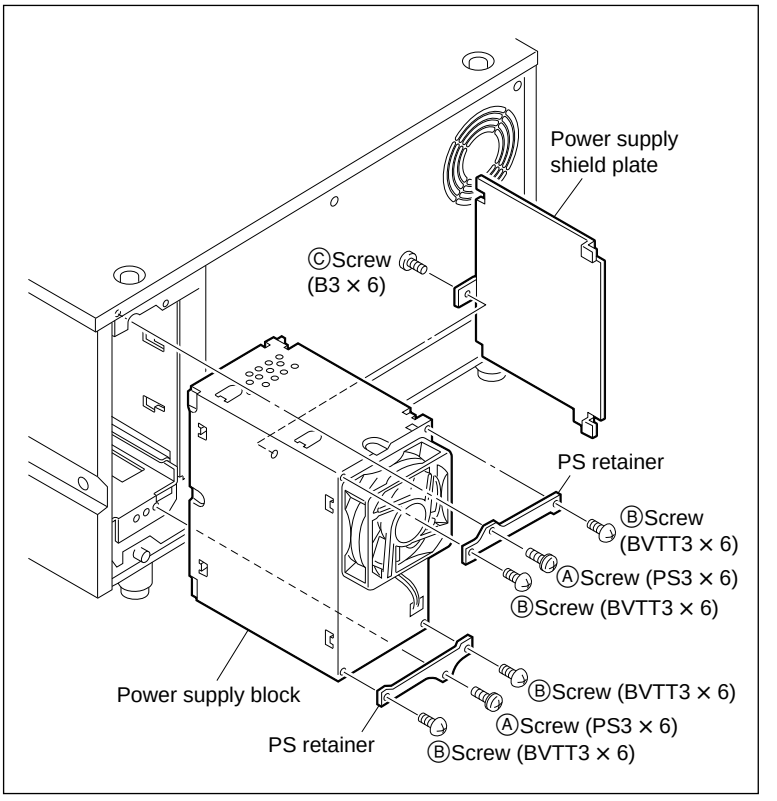
4. Power Supply Block Removal

(1) Remove the two screws (Ⓐ).
(2) Pull out the power supply block.

Installation

5. Power Supply Block Installation

(1) Remove the four screws (Ⓑ) and remove the two PS retainers.
(2) Remove a screw (Ⓒ) and remove the power supply shield plate.
(3) Install the two PS retainers to new power supply block with the four screws (Ⓑ).
(4) Install the power supply shield plate to new power supply block with a screw (Ⓒ).
(5) Install the power supply block with the two screws (Ⓐ).



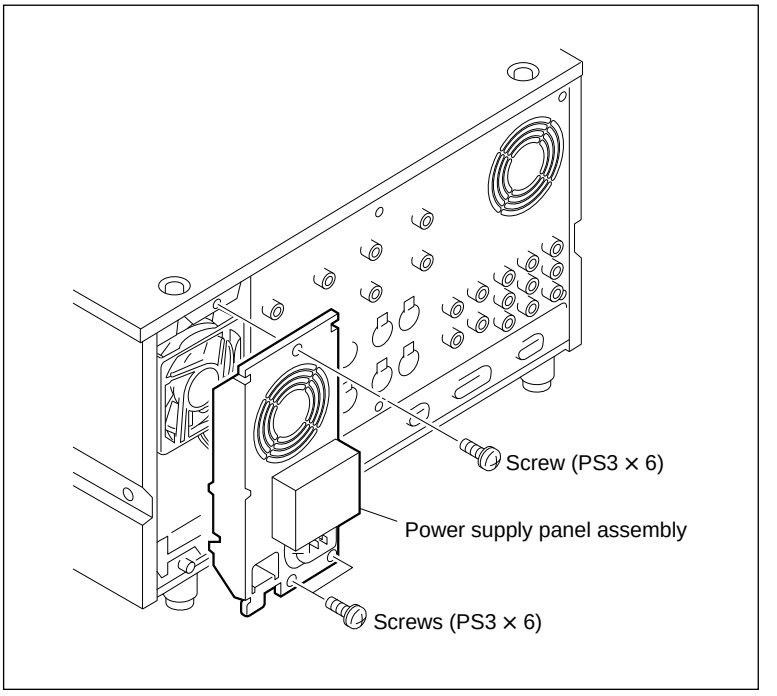
Power Supply Block Removal/Installation

6. Power Supply Panel Assembly Installation

Install the power supply panel assembly with the three screws.

Note

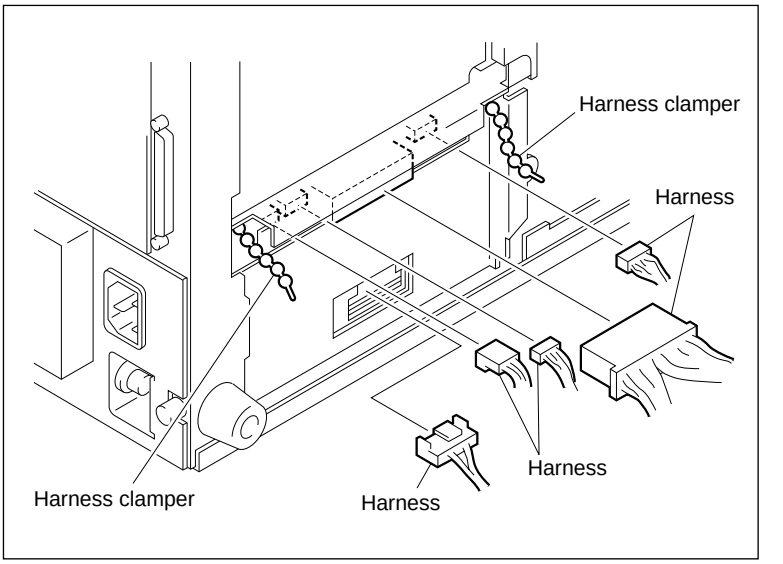
Be careful not to catch the harness.



Power Supply Panel Assembly Installation

7. Harnesses Connection

(1) Connect the each harness to five connectors shown in the figure.
(2) Hold the harnesses with the harness clampers.



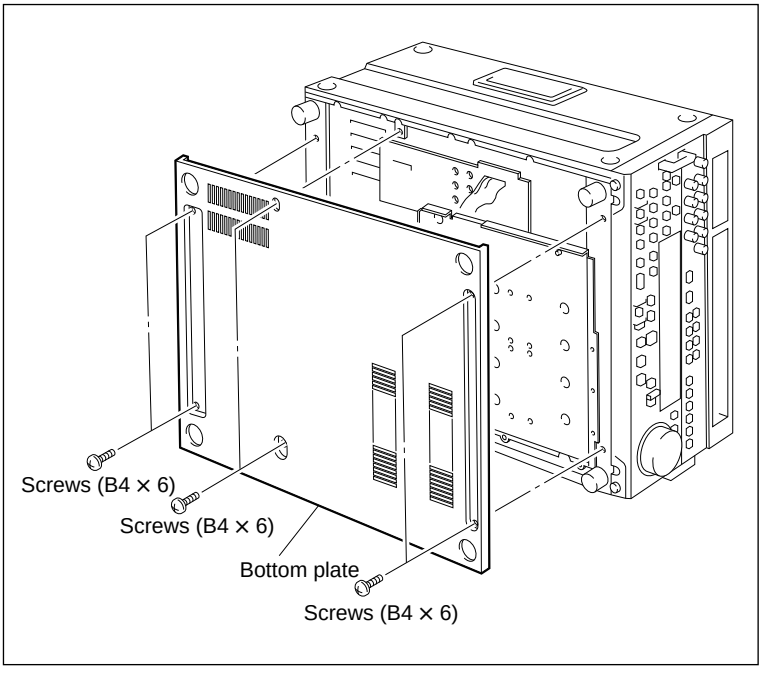
Harnesses Connection

8. Bottom Plate Installation

(1) Install the bottom plate with the six screws.
(2) Put the unit back.

9. Operation Confirmation

Turn the power on and confirm the unit runs in normal condition.



Bottom Plate Installation

5-31. Hard Disk Drive Replacement

5-31-1. Caution for Handling the Hard Disk Drive

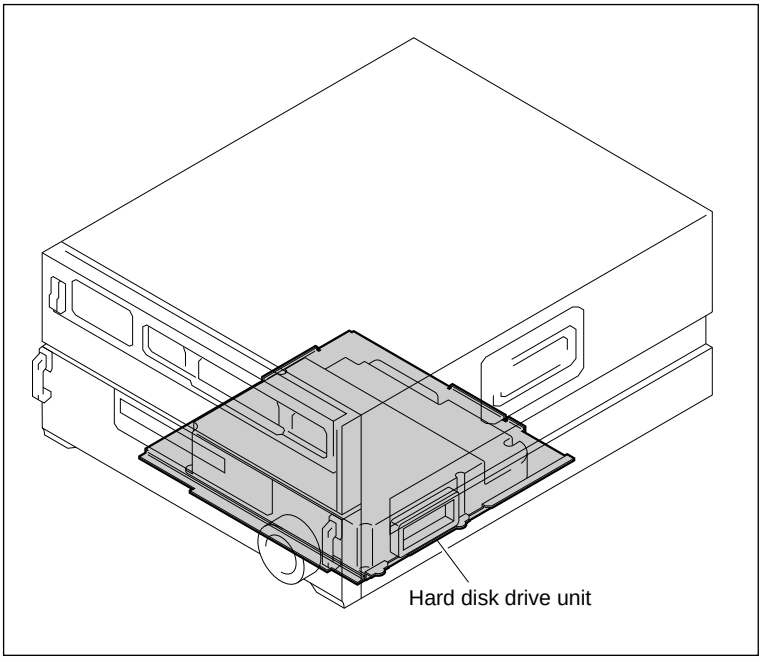
Refer to “Caution for Handling the Unit with Built-in HDDs (for Part2)” (described after Manual Structure) for handling the hard disk drive unit and hard disk drive, and perform operations with extra care.
Moreover, pack the failed hard disk drive using specified packing materials when a failure occurs in the hard disk drive, then contact Sony’s sales organization.

- HDD cushion
  It is recommended to use the HDD cushion (newly adopted tool) for protecting the hard disk drive on operating.

- Shockless torque screwdriver
  Use the shockless torque screwdriver (newly adopted fixture) when tightening the screws during replacing the hard disk drive. If the traditional torque screwdriver is used, it may be applied a fatal shock to the hard disk drive by the click of torque screw driver. Be sure to use the shockless torque screwdriver.
  When the set torque is reached using the shockless torque screwdriver, the shockless screwdriver turns free approx.90˚ without shock.

5-31-2. Removal/Installation of Hard Disk Drive Unit

This section describes how to remove and install the hard disk drive unit. To replace the hard disk drive, refer to the next section “Hard disk Drive Replacement”.



Rmoval/Installation of Hard Disk Drive

Outline

Replacement

1. Remove the Bottom Plate
2. Remove the Hard Disk Drive
3. Replace the Hard Disk Drive
4. Attach the Hard Disk Drive
5. Attach the Bottom Plate

Preparation

1. Turn the power off and then wait over 30 seconds.

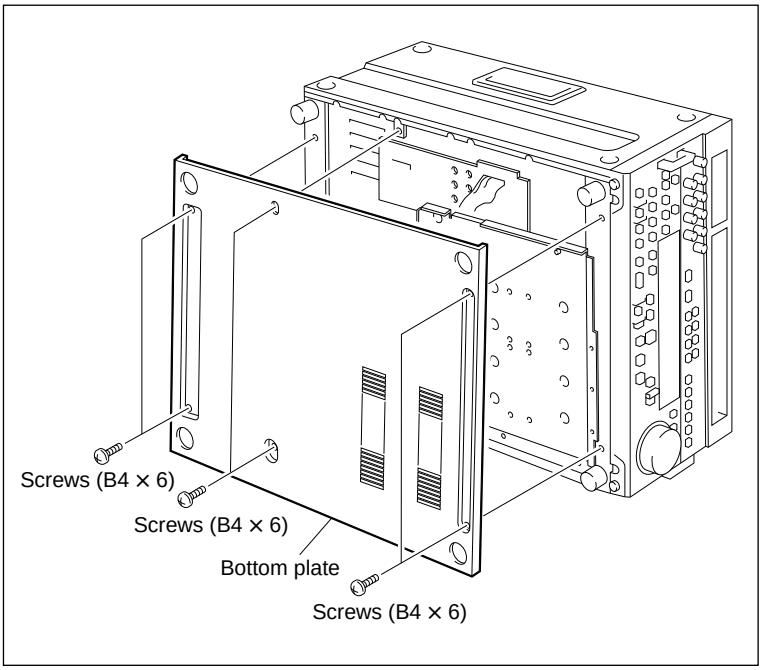
Tools

- Toque screwdriver's bit (+3 mm, l=50 mm): J-6323-430-A
- HDD cushion: J-6530-060-A
- Shockless toque screwdriver (12 kg•cm): J-6530-070-A

Removal

1. Remove the Bottom Plate

(1) Place the unit on its right side panel down.
(2) Remove the six screws and the bottom plate.



Remove the Bottom Plate

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2. Remove the Hard Disk Drive Unit

(1) Remove the two screws and the HDD lid.

(2) Release the three harness holders shown in the figure.

(3) Disconnect the two SCSI connectors and the two power harness's connectors from each hard disk drive.

(4) Disconnect the harness from the connector CN1 on the SE-378 board.

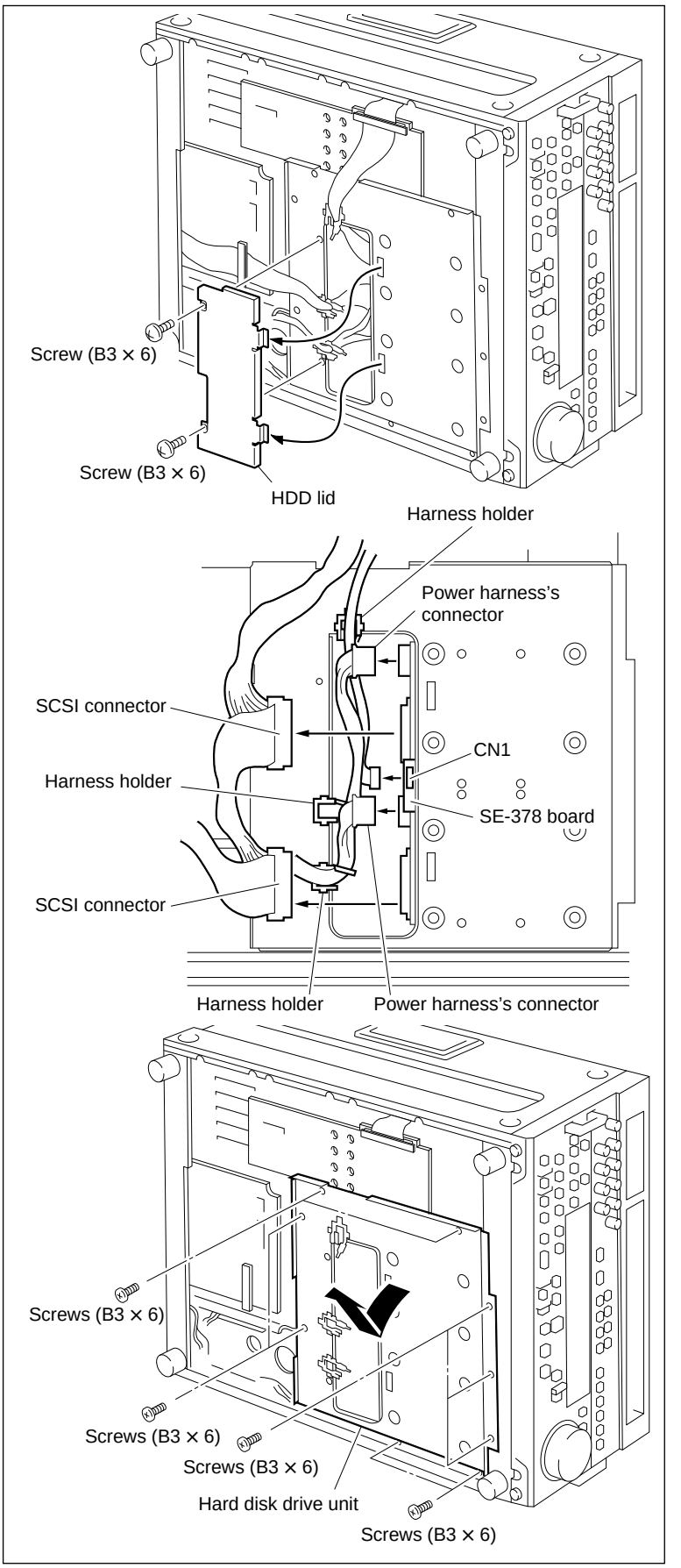
(5) Remove the nine screws and remove the hard disk drive unit from the unit in slanting shown in the figure.

Note

Be sure to put the removed hard disk drive unit on the HDD cushion.

3. Replace the Hard Disk Drive

Refer to Section 5-31-3.



Remove the Hard Disk Drive Unit

Installation

4. Attach the Hard Disk Drive Unit

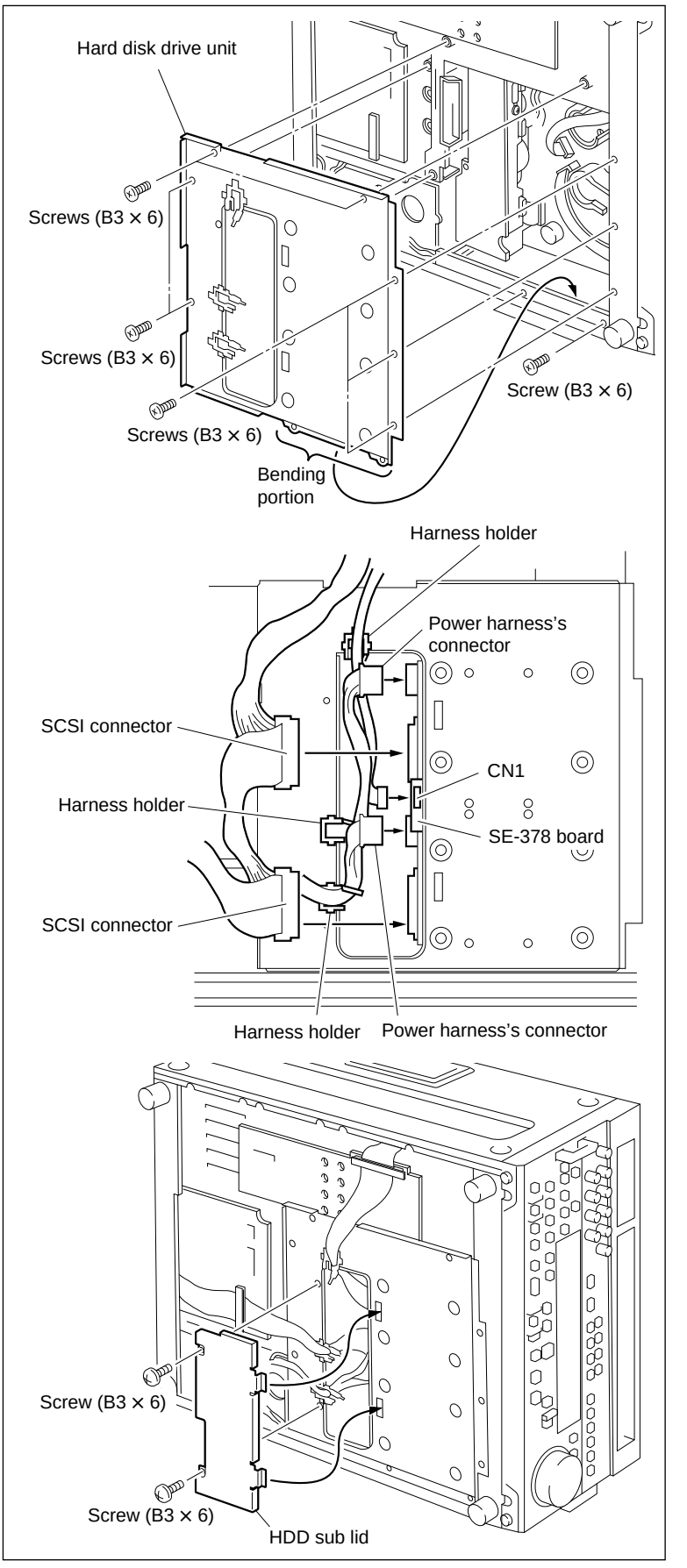
(1) Put the bending portion of the hard disk drive unit into the inside of the chassis.
(2) Attach the hard disk drive unit with the nine screws.

(3) Connect the harness to CN1 on the SE-378 board.
(4) Connect the two SCSI connectors and the two power harness's connectors to each hard disk drive.
(5) Hold the harnesses with the three harness holders.

(6) Attach the HDD lid with the two screws.

5. Attach the Bottom Plate

(1) Attach the bottom plate with the six screws.
(2) Gently put the unit back.



Install the Hard Disk Drive Unit

5-31-3. Hard Disk Drive Replacement

Outline

Replacement

1. Remove the Hard Disk Drive Unit (Refer to steps 1 and 2 in Section 5-31-2.)
2. Remove the Hard Disk Drive Cover
3. Remove the Hard Disk Drives
4. Set the SCSI' ID
5. Attach the Hard Disk Drive
6. Confirm the Motor Start Option
7. Attach the Hard Disk Cover
8. Attach the Hard Disk Drive Unit (Refer to steps 4 and 5 in Section 5-31-2.)

Notes

- Be sure to perform all of jobs described in this section on the HDD cushion (tool).
- Be sure to use the specified shockless toque screwdriver when tightening screws described in this section. Never use a ratchet-type traditional toque screwdriver.

Preparation

1. Turn the power off and then wait over 30 seconds.

Tools

- Toque screwdriver's bit (+3 mm, l=50 mm): J-6323-430-A
- HDD cushion: J-6530-060-A
- Shockless toque screwdriver (12 kg•cm): J-6530-070-A

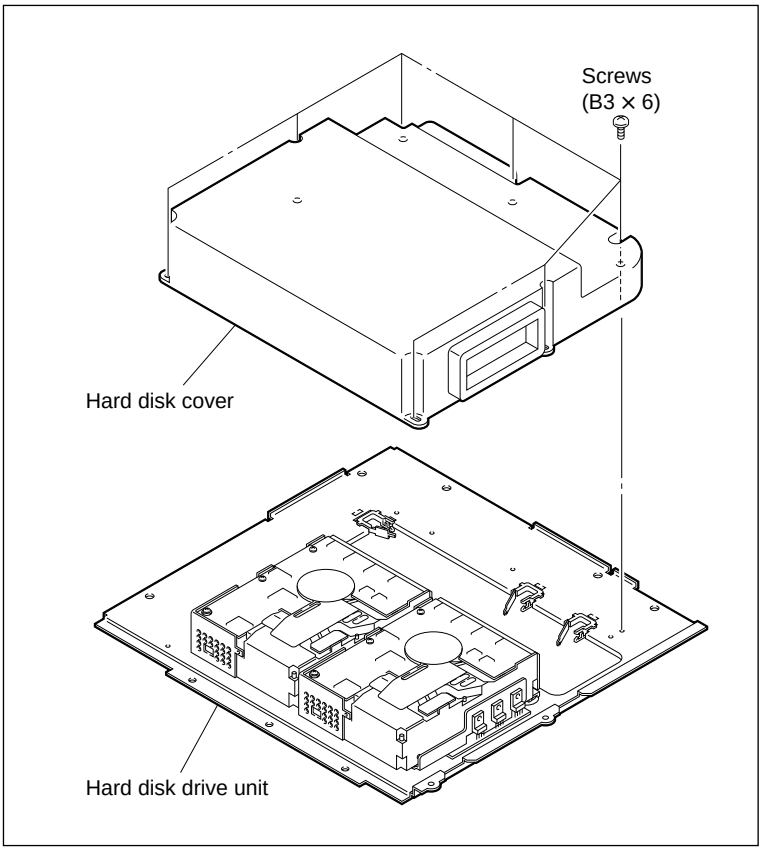
Removal

1. Remove the Hard Disk Drive Unit

Refer to steps 1 and 2 in Section 5-31-2.

2. Remove the Hard Disk Cover

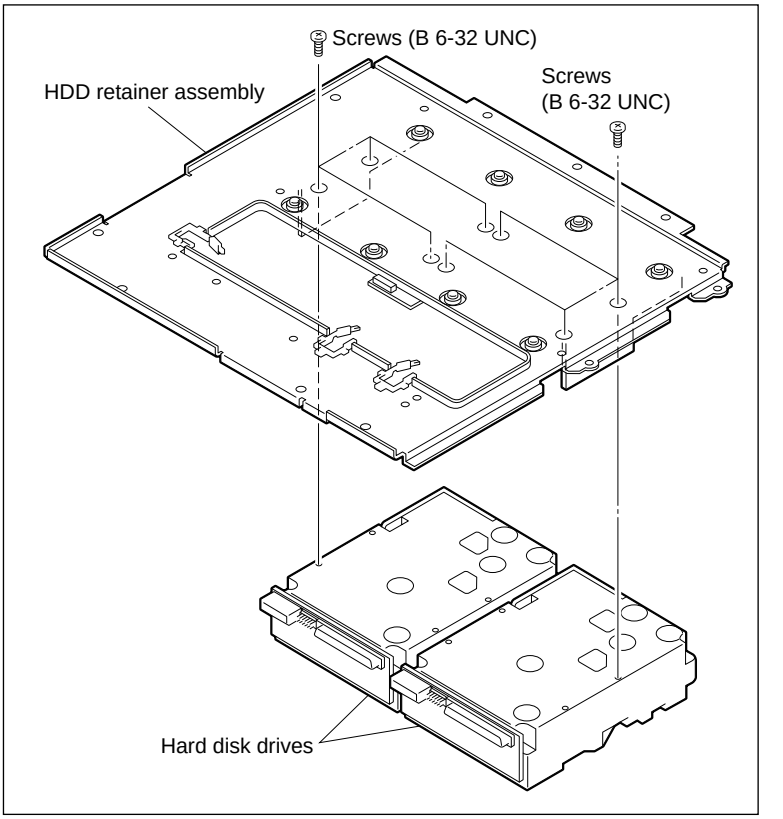
Remove the seven screws and the hard disk cover.



Remove the Hard Disk Cover

3. Remove the Hard Disk Drives

(1) Turn the hard disk drive unit upside down on the HDD cushion.
(2) Insert a screwdriver to the eight holes shown in the figure and remove the screws.
(3) Take off the HDD retainer assembly. Then the two hard disk drives are placed on the HDD cushion.

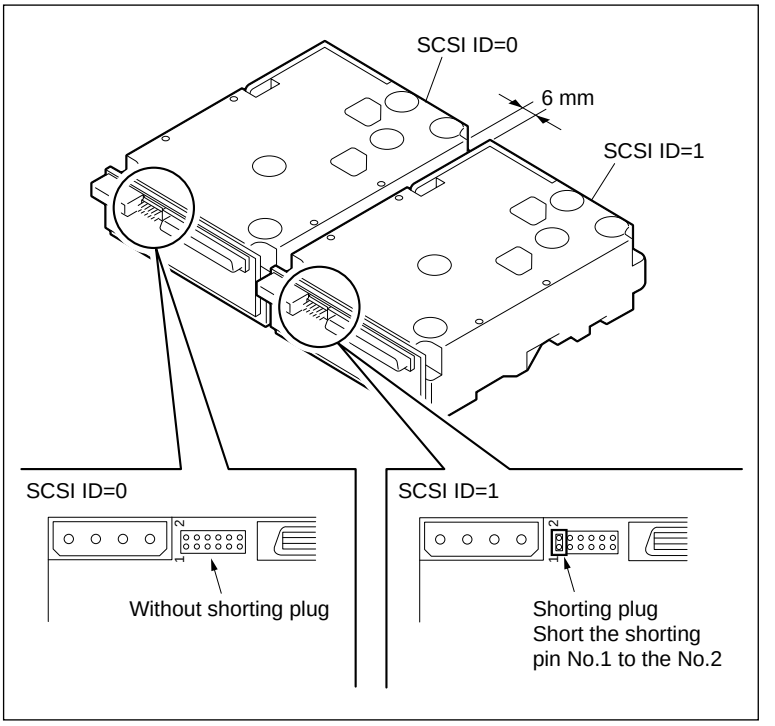


Remove the Hard Disk Drives

Installation

4. Set the SCSI's ID

Insert the short plug to the short pins of two hard disk drives corresponding to each SCSI's ID number (0 or 1) as shown in the figure.



Set the SCSI's ID

5. Attach the Hard Disk Drives

Note

Perform the following jobs with special care not to apply any shock to the hard disk drives.

(1) Place the two hard disk drives with 6 mm spacing on the HDD cushion shown in the figure.

(2) Put the HDD retainer assembly gently on the two hard disk drives from above, and align the eight screw holes.

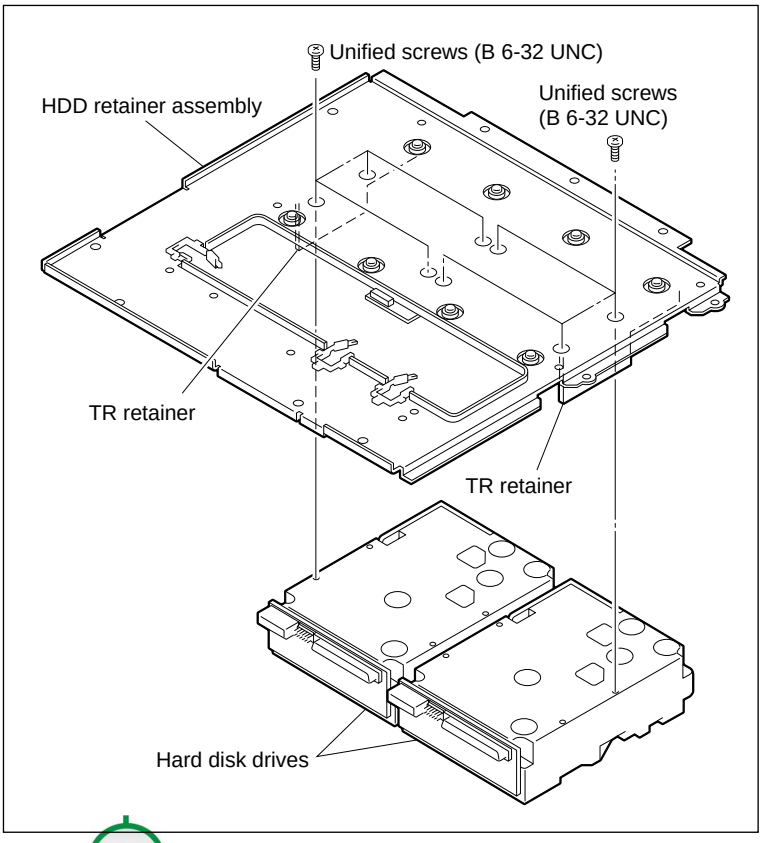
Note

Take special care not to contact the TR retainers of the HDD retainer assembly with the two hard disk drives.

(3) Install the two hard disk drives to HDD retainer assembly with the eight unify screws.

Tightening torque: 98×10^{-2} N • m
{10.0 kgf • cm}

(4) Turn the hard disk drive unit downside up on the HDD cushion.



Attach the Hard Disk Drive

6. Confirm the Motor Start Option

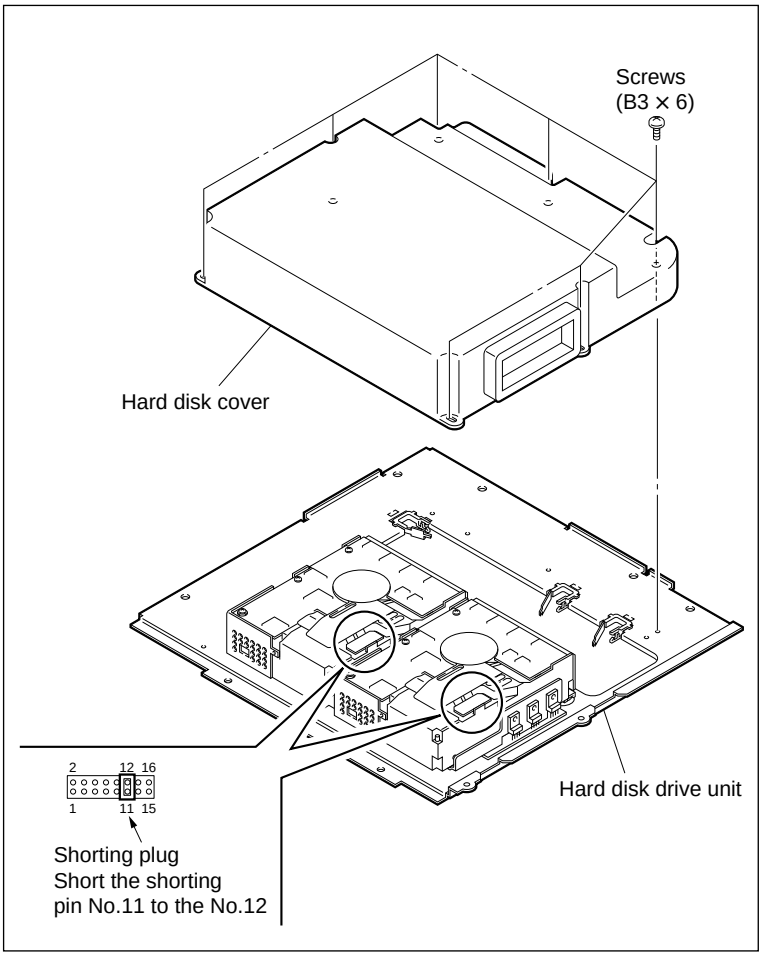
Confirm that the short plug is connected to each J2 connector on the newly installed two hard disk drive units as shown in the figure.

7. Attach the Hard Disk Cover

Attach the hard disk cover with the seven screws.

8. Attach the Hard Disk Drive Unit

Refer to the steps 4 and 5 in Section 5-31-2.



Attach the Hard Disk Drive Unit

5-32. Replacement of Mounted Circuit Board

This section explains the replacement procedures of circuit boards except plug-in boards.
Refer to Section 6 in Maintenance Manual Part 1 for piug-in board replacement.

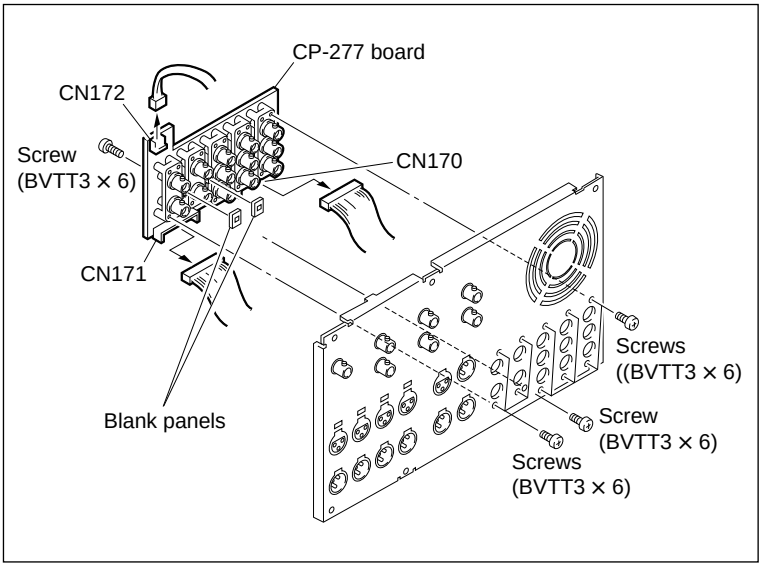
5-32-1. CP-277 Board

Replacement

1. Turn the power off.
2. Remove the connector panel.
   (Refer to Section 2-3-3 in Maintenance Manual Part 1.)
3. Remove the twelve screws shown in the figure.
4. Disconnect the harness from the connectors (CN170,CN171, and CN172) on the CP-277 board, then remove the CP-277 board.

   Note

   In this way the two blank panels will remove. Be careful not lose them.



5. Install the CP-277 board in the reverse order of steps 2 through 4.

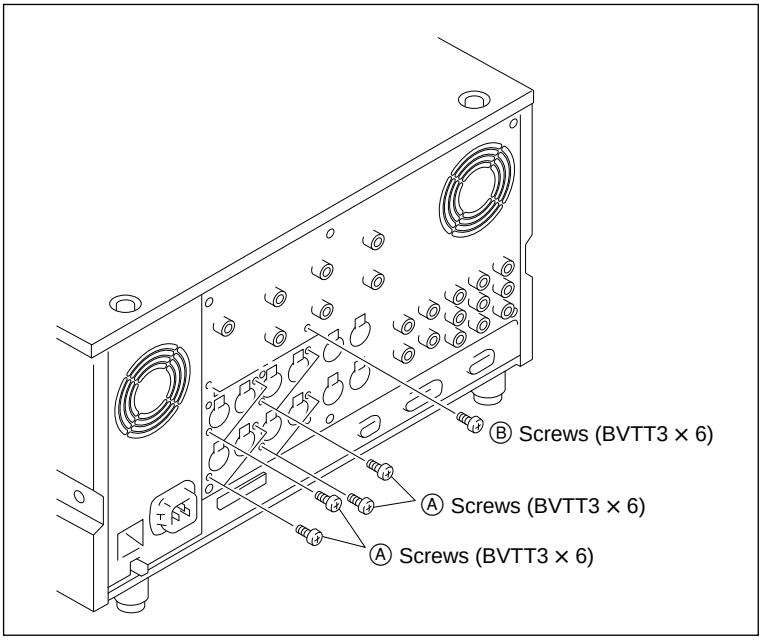
Adjustment after Replacement

6. Confirm that the component video output signal and composite video output signal are output in normal state.
7. (In case that the BKDW-505 or the BKDW-506 is installed)
   Perform the “Check After Installing” refering Section 1-16-2 in Maintenance Manual Part 1.
8. (In case that the BKNW-104 is installed)
   Perform the “Adjustment After Installing” refering Section 1-18-2 in Maintenance Manual Part 1.

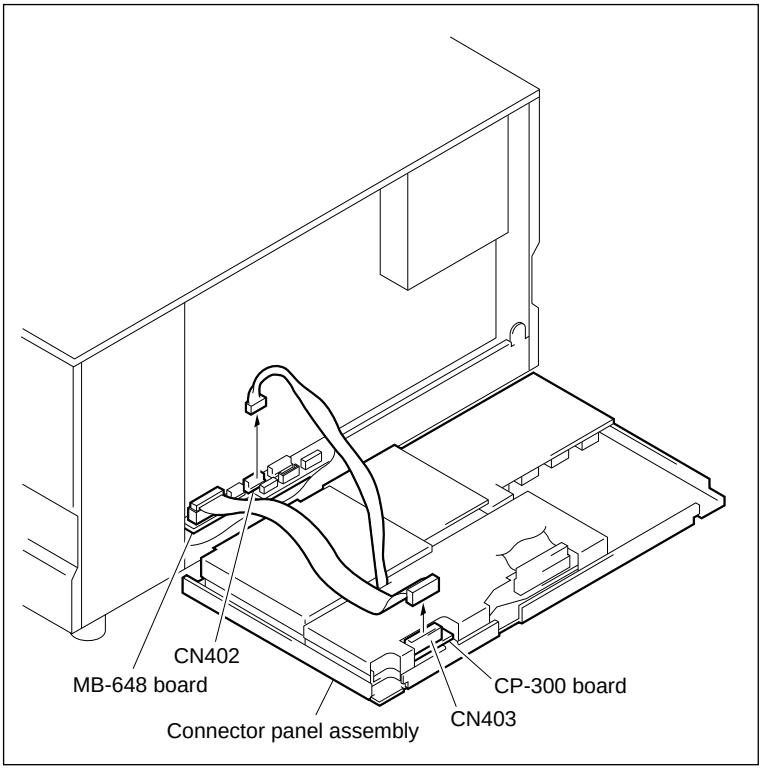
5-32-2. CP-278 Board

Replacement

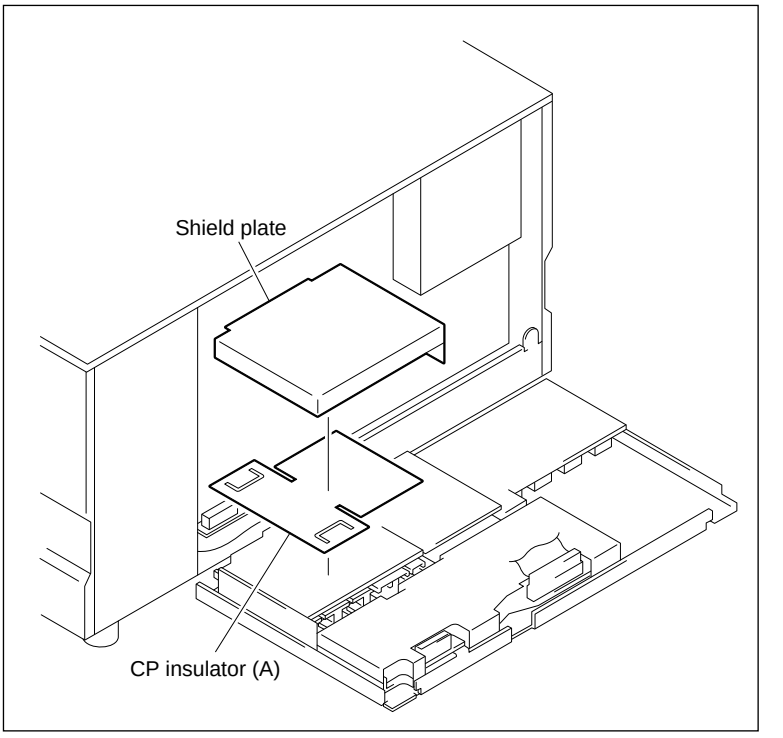
1. Turn the power off.
2. Remove the eight screws (BVTT 3 × 6) shown as Ⓐ in the figure.
3. Remove the two screws (BVTT 3 × 6) shown as Ⓑ in the figure.



4. Remove the connector panel assembly. (Refer to Section 2-3-3 in Maintenance Manual Part 1.)
5. Disconnect the harness from the connector CN402 on the MB-648 board.
6. When the BKNW-103 (CP-300 board) is installed:
   Disconnect the flat cable from the connector CN403 on the CP-300 board.



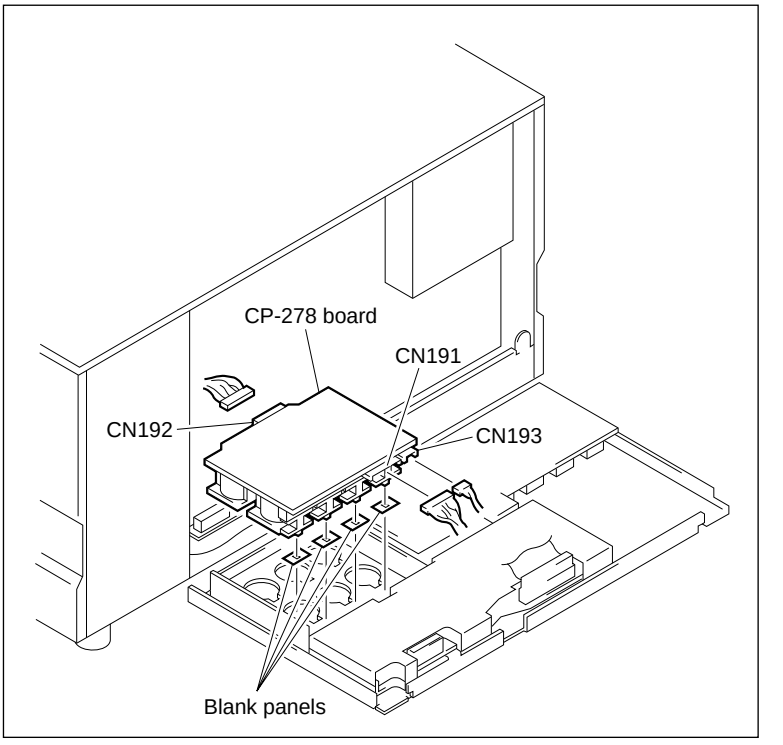
7. Remove the shield plate and CP insulator (A).



8. Disconnect the harnesses from the connectors (CN191, CN192, and CN193) on the CP-278 board, then remove the CP-278 board.

Note

In this way the four blank panels will remove. Be carefull not to lose them.



9. Install the CP-278 board in the reverse order of steps 2 through 8.

Note

Adjustment after replacement is not required.

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5-32-3. CP-297 Board

Notes

- If the BKNW-103 (SDDI input board, optional) is installed on the unit, it is neccesary to remove the BKNW-103 before removing the CP-297 board. In this case, remove the BKNW-103 first (refer to Section 5-32-4.) and perform the procedure of the steps 6 and later described in this section.
- Perform the operation confirmation after the CP-297 board replacement.

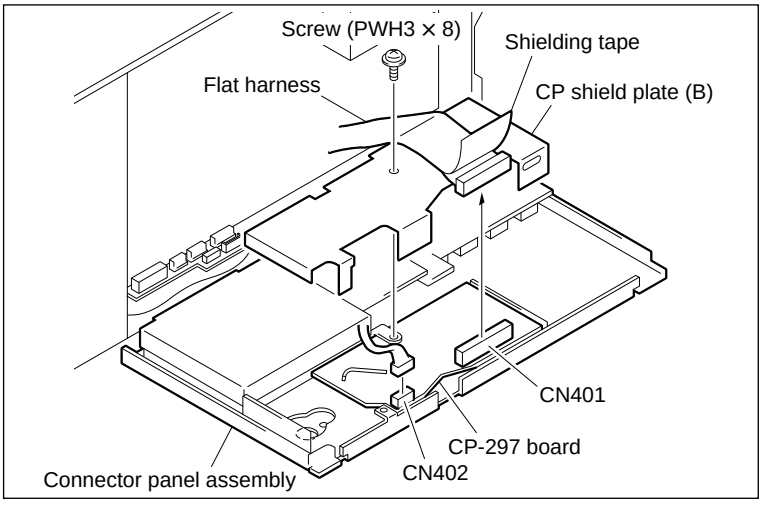
Replacement

1. Turn off the power.
2. Remove the connector panel assembly. (Refer to the Section 2-3-3 in Maintenance Manual Part 1)
3. Peel off the shielding tape from the connector panel.
4. Remove a screw fixing the CP shield plate (B).
5. Disconnect the flat harness (60-pin) from the connector (CN401) on the CN-297 board, and remove the CP shield plate (B) simultaneously.

   Note

   The flat harness is pasted on the CP shield plate (B).

6. Disconnect the harness from the connector (CN402).



7. Remove the four screws as shown in the figure, then remove the CP-297 retainer from the connector panel.
8. Remove the six nuts of BNC connectors, then remove the CP-297 board from the CP-297 retainer.

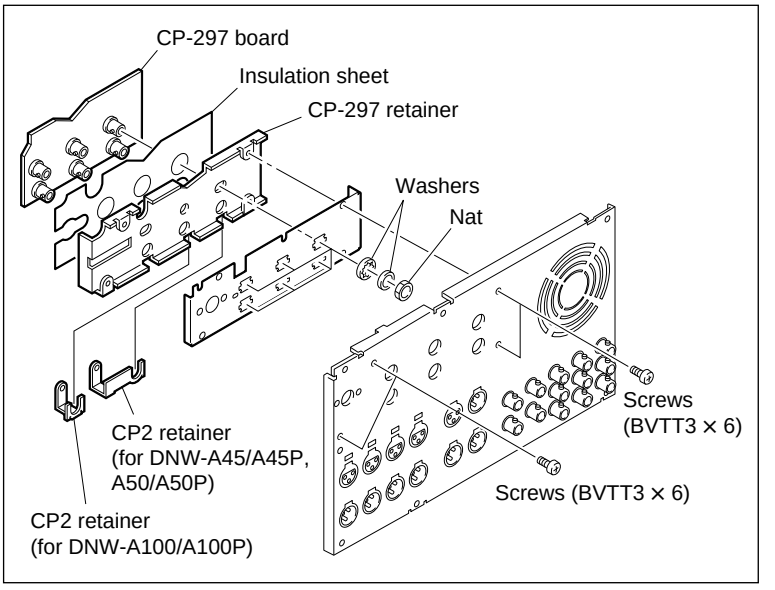
   Note

   The CP2 retainer and the insulation sheet are removed simultaneously when the CP-297 board is removed. Be careful not to lose them.

9. Install the CP-297 board in the reverse order of steps 2 through 8.

   Note

   When reinstalling the BKNW-103, refer to Section 1-17 in Maintenance Manual Part 1.



10. Perform the operation confirmation.

5-32-4. CP-300 Board (BKNW-103)

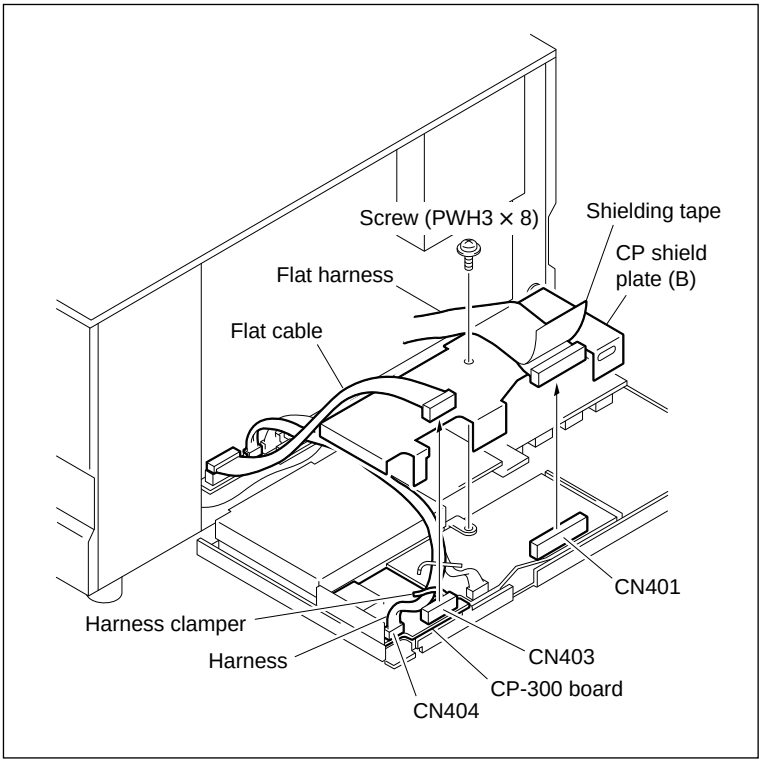
Replacement

1. Turn off the power.
2. Remove the connector panel assembly. (Refer to Section 2-3-3 in Maintenance Manual Part 1.)
3. Peel off the shielding tape from the connector panel.
4. Remove a screw fixing the CP shield plate (B).
5. Disconnect the flat harness (60-pin) from the connector (CN401) on the CN-297 board, and remove the CP shield plate (B) simultaneously.

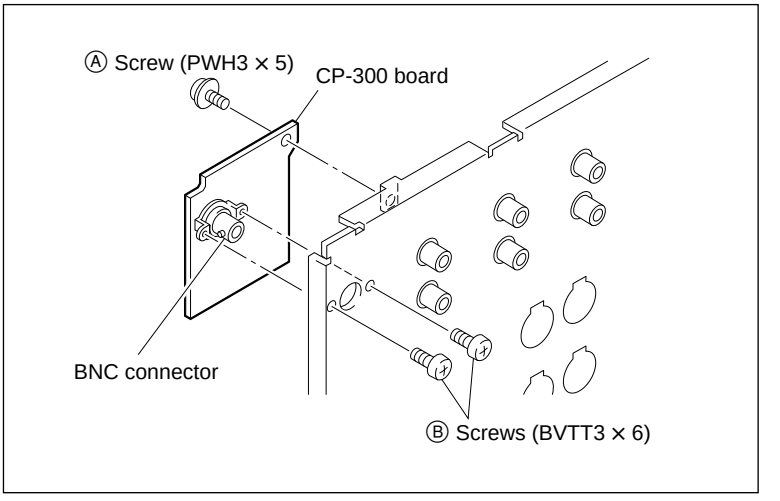
   Note

   The flat harness is pasted on the CP shield plate (B).

6. Strech the harness clamper and release the harness.
7. Disconnect the harness and flat cable from the connectors (CN403 and CN404) on the CP-300 board.



8. Remove the two screws Ⓑ across the BNC connector.
9. Remove the screw Ⓐ as shown in the figure, then remove the CP-300 board.

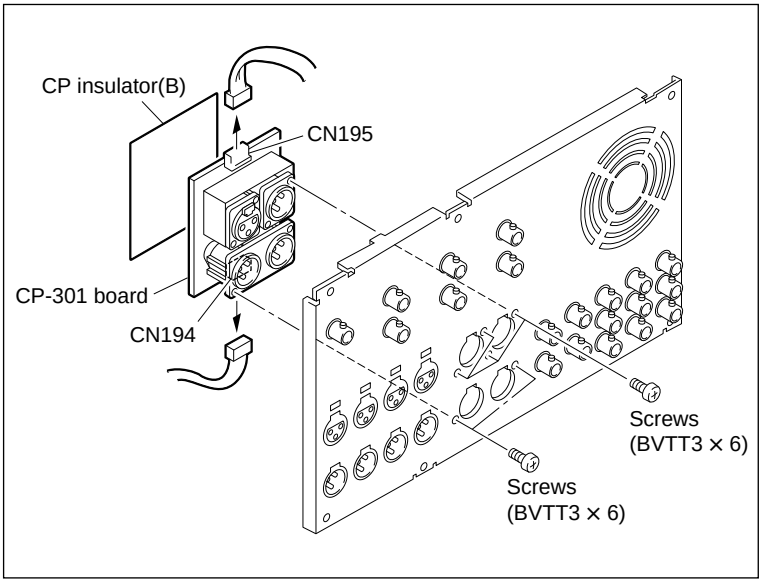


10. Install the CP-300 board refer to Section 1-17 in Maintenance Manual Part 1.

5-32-5. CP-301 Board

Replacement

1. Turn off the power.
2. Remove the connector panel assembly. (Refer to Section 2-3-3 in Maintenance Manual Part 1.)
3. Remove the six screws as shown in the figure.
4. Disconnect the hernesses from the connectors (CN194 and CN195) on the CP-301 board, then remove the CP-301 board.
5. Remove the CP insulator (B).



6. Install the CP-301 board in the reverse order or steps 2 through 5.

Note

Adjustment after replacement is not required.

5-32-6. DR-315 Board

Note

When replacing the DR-315 board, the hard disk drive unit has to be removed. The handling of the removed hard disk drive unit should be complied with “Caution for Handling the Unit with Build-in HDDs” (described after Manual Structure), and perform operations with extra care not to apply any shocks to the hard disk drive unit.

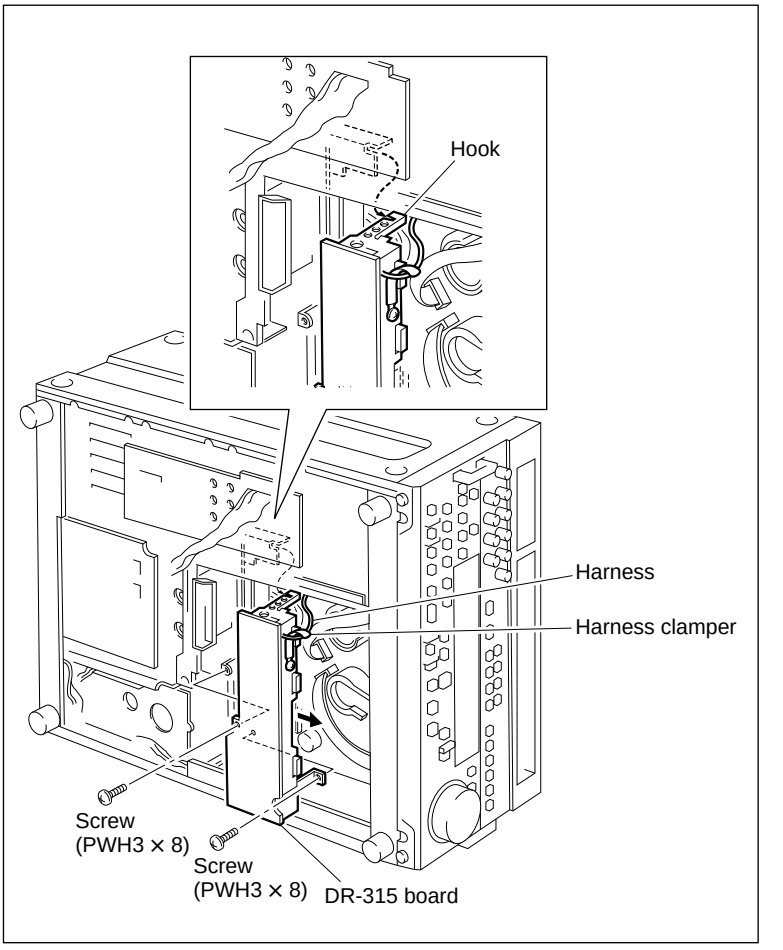
Replacement

1. Turn off the power.
2. Place the unit on its right side panel down.
3. Remove the six screws, then remove the bottom plate.
   (Refer to Section 2-3-1 in Maintenance Manual Part 1.)
4. Remove the hard disk drive unit.
   (Refer to Section 5-31-2.)
5. Stretch the harness clamper on the DR-315 board and release the harness.
6. Remove the two screws shown in the figure.
7. Move the DR-315 board toward the reel motors, and detach the hook.

   Note

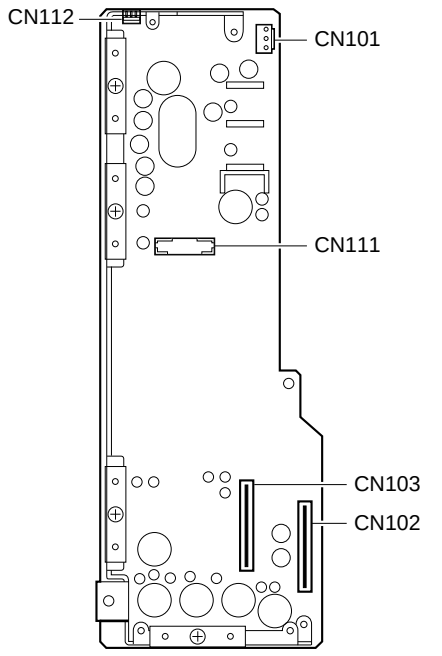
   The hook is hard to be seen since it is the inner part.

8. Pull out the DR-315 board as far as possible as shown in the figure.



9. Disconnect the hernesses and the flexible boards from the connectors (CN101, CN102, CN103, CN111 and CN112) on the DR-315 board, then remove the DR-315 board.

<DR-315 board, side A>



10. Install the DR-315 board in the reverse order of steps 2 through 9.

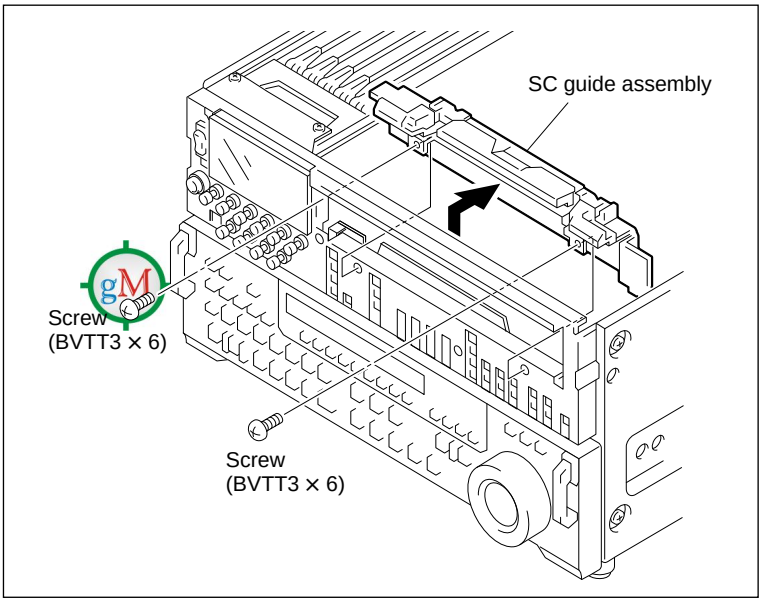
Adjustment after Replacement

11. Perform the electrical adjustment in servo system.
(Refer to Sections 3-4-3 and 3-4-5.)

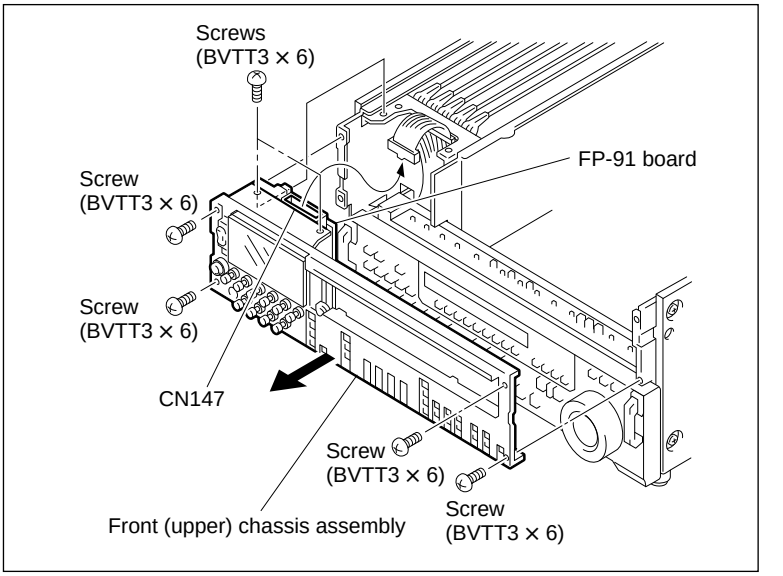
5-32-7. FP-91 Board

Replacement

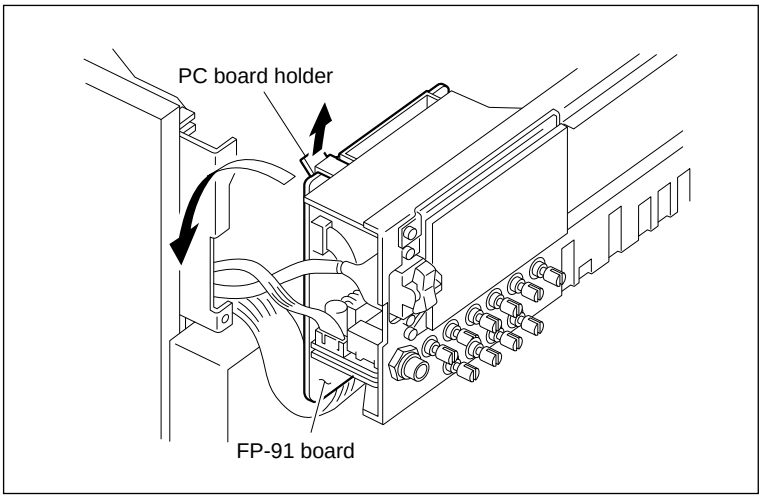
1. Turn off the power.
2. Remove the upper lid.
   (Refer to Section 2-3-1 in Maintenance Manual Part 1.)
3. Remove the plate MD assembly.
   (Refer to Section 2-4 in Maintenance Manual Part 1.)
4. Remove the cassette compartment assembly.
   (Refer to Section 2-5 in Maintenance Manual Part 1.)
5. Remove the upper control panel.
   (Refer to Section 2-3-2 in Maintenance Manual Part 1.)
6. Remove the two screws, then remove the SC guide assembly.



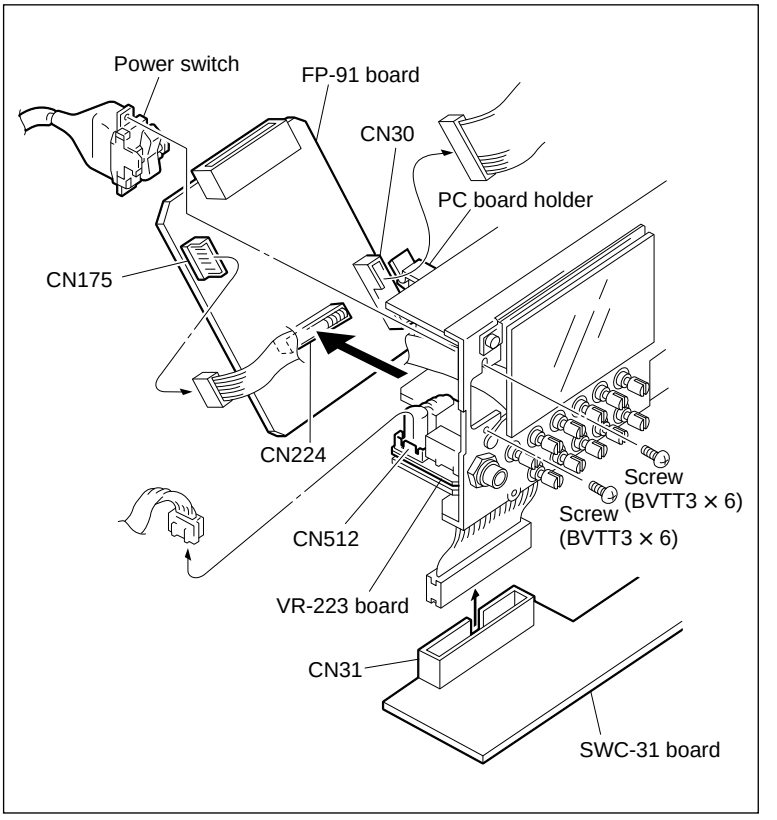
7. Disconnect the flat cable from the connector (CN147) on the FP-91 board.
8. Remove the six screws, then pull out the front (upper) chassis assembly.



9. Undo the PC board holder, then open the FP-91 board.



10. Remove the two screws, then remove the power switch.
11. Disconnect the flat cable from the connector (CN30) on the FP-91 board.
12. Disconnect the harnesses and the flat cable from the connector (CN512) on the VR-223 board, connector (CN31) on the SWC-31 board, connector (CN175) on the FP-91 board, and remove the front (upper) chassis assembly.
13. Disconnect the harness from the connector (CN224) on the FP-91 board, then remove it.
14. Install the FP-91 board in the reverse order of steps 2 through 13.



Note

When connecting connector CN224, fit the protrusion of connector on the VR-224 board into the groove of CN224, then set up the FP-91 board vertically.

Adjustment after Replacement

15. Perform the TBC remote control offset adjustment.
(Refer to Section 3-9.)

5-32-8. KY-364 Board

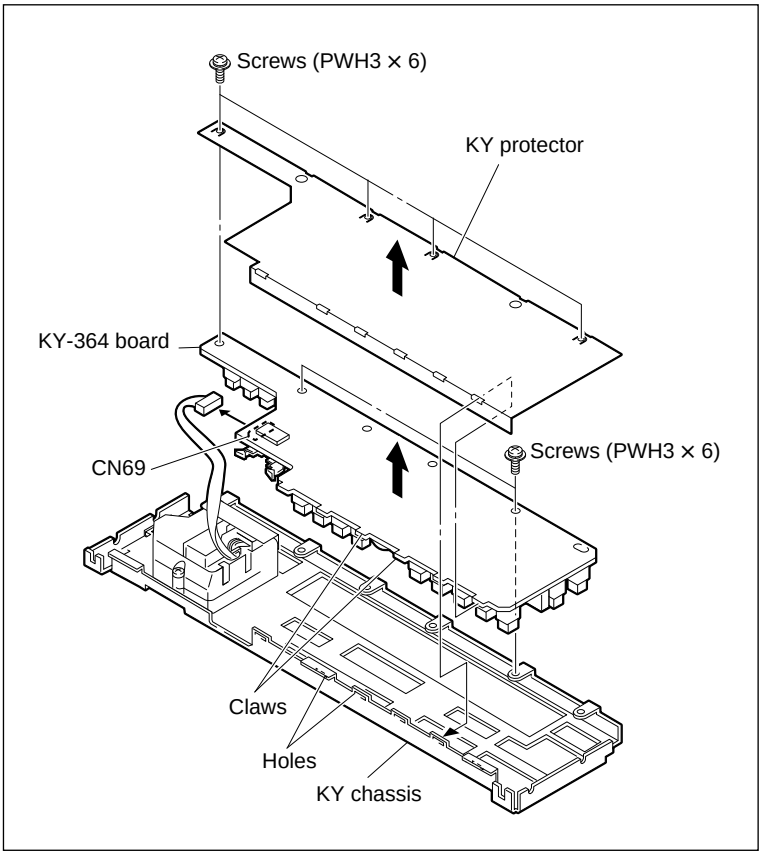
Replacement

1. Turn off the power.
2. Remove the lower control panel assembly. (Refer to Section 2-6 in Maintenance Manual Part 1.)
3. Remove the six screws shown in the figure, then remove the KY protector and KY-364 board.

   Note

   While pulling out the claws of the KY-364 board from the holes of the KY chassis, remove the KY protector and KY-364 board simultaneously.

4. Disconnect the harness from the connector (CN69).



5. Install the KY-364 board in the reverse order of steps 2 through 5.

Note

Adjustment after replacement is not required.

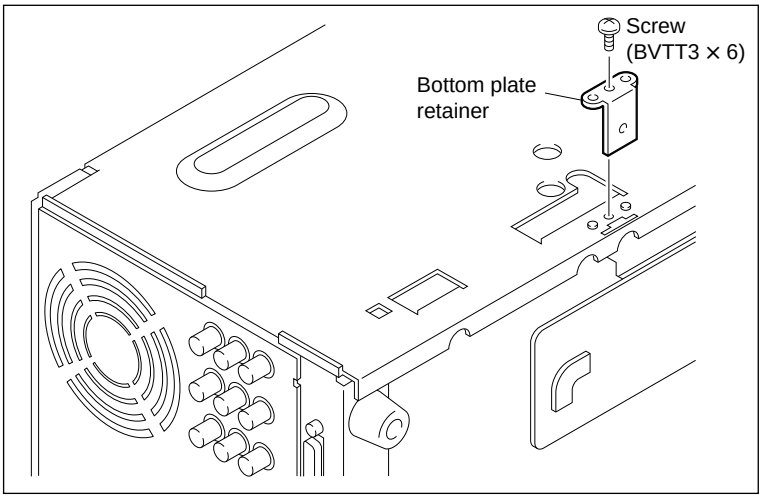
5-32-9. MB-648 Board

Note

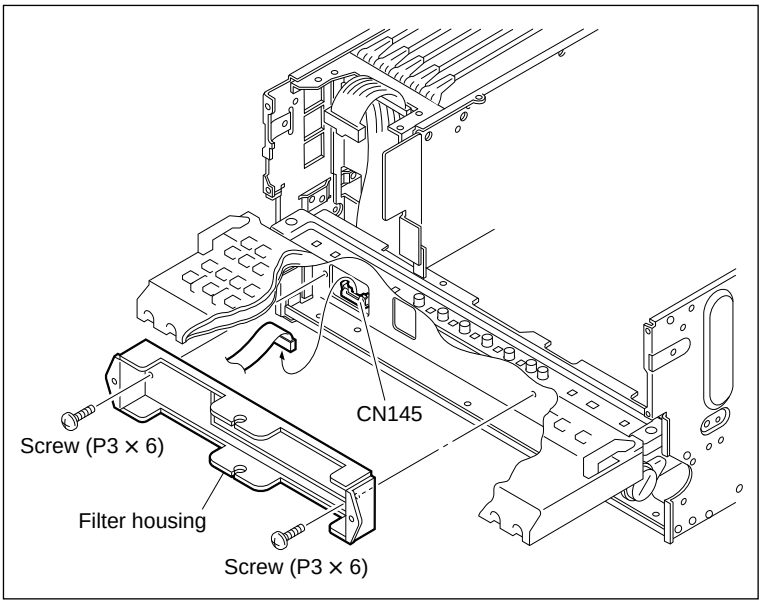
When replacing the MB-648 board, the hard disk drive unit has to be removed. The handling of the removed hard disk drive unit should be complied with “Caution for Handling the Unit with Build-in HDDs” (described after Manual Structure), and perform operations with extra care not to apply any shocks to the hard disk drive unit.

Replacement

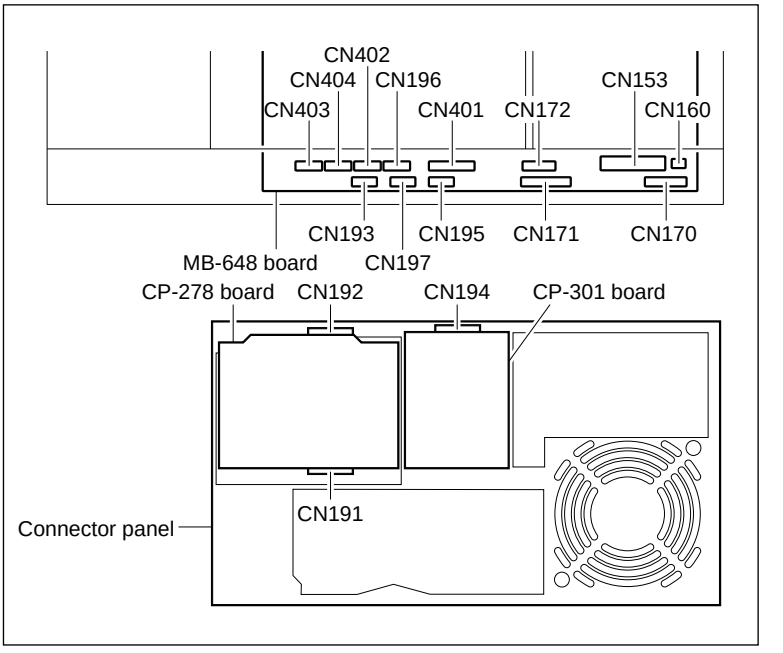
1. Turn off the power.
2. Remove the upper lid.
   (Refer to the Section 2-3-1 in Maintenance Manual Part 1.)
3. Remove the plate MD assembly.
   (Refer to Section 2-4 in Maintenance Manual Part 1.)
4. Remove the cassette compartment assembly.
   (Refer to Section 2-5 in Maintenance Manual Part 1.)
5. Remove the upper control panel.
   (Refer to Section 2-3-2 in Maintenance Manual Part 1.)
6. Remove the FP-91 board.
   (Refer to Section 5-32-7.)
7. Pull out the all plug-in boards.
   (Refer to Section 2-13 in Maintenance Manual Part 1.)
8. Remove the right side panel.
   (Refer to Section 2-3-1 in Maintenance Manual Part 1.)
9. Remove the left side panel.
   (Refer to Section 2-3-1 in Maintenance Manual Part 1.)
10. Remove the screw and remove the bottom plate retainer.
11. Remove the air filter.
    (Refer to Section 5-6.)



12. Remove the two screws and remove the filter housing.
13. Disconnect the flat cable from the connector (CN145) on the MB-648 board.
14. Remove the power supply block.
    (Refer to Section 5-30.)
15. Remove the connector panel.
    (Refer to Section 2-3-3 in Maintenance Manual Part 1.)



16. Disconnect the harnesses from the following connectors on the MB-648 board.
    - Power block harness:
      CN153
    - Fan motor (rear) harness:
      CN160
    - Connector panel harnesses:
      CN170, CN171, CN172, CN193, CN195, CN401, and CN402
    - Option board (CP-308) harnesses:
      CN196 and CN197
    - Option board (CP-300) harnesses:
      CN403 and CN404
17. Disconnect the harnesses from the connectors CN191, CN192, and CN194 on the CP-278 and CP-301 boards.
    (Refer to Sections 5-32-2 and 5-32-5.)



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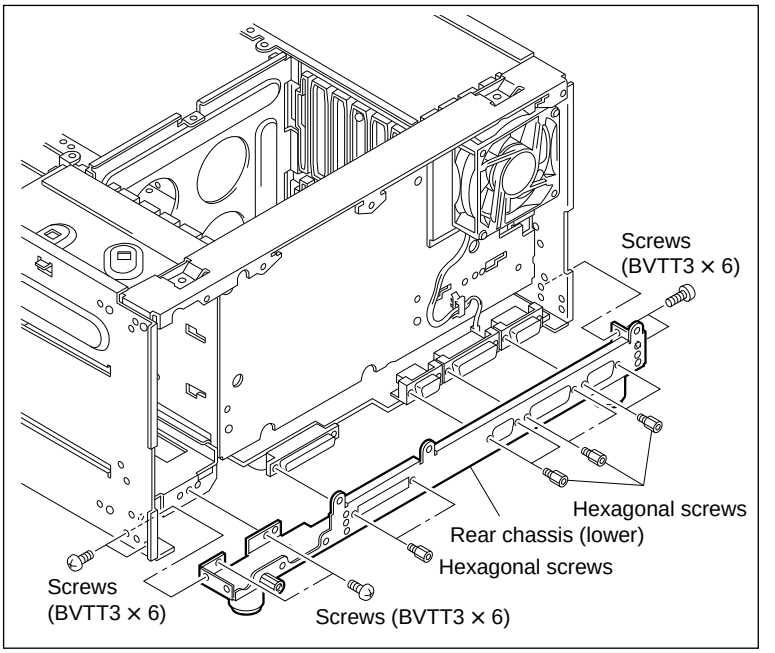
18. Remove the eight hexagonal screws from the connectors on the rear chassis (lower).
19. Remove the six screws and remove the rear chassis (lower).

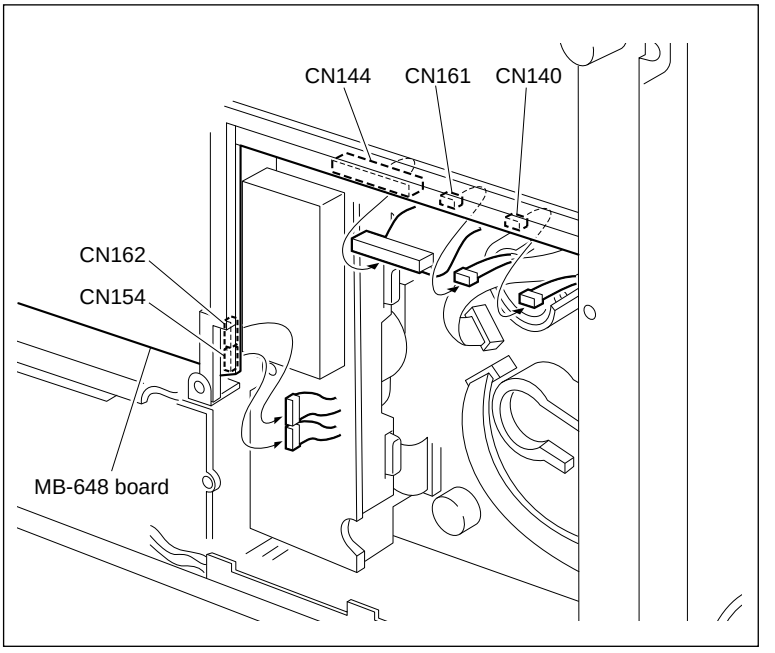


20. Remove the hard disk drive unit.
(Refer to Section 5-31-2.)

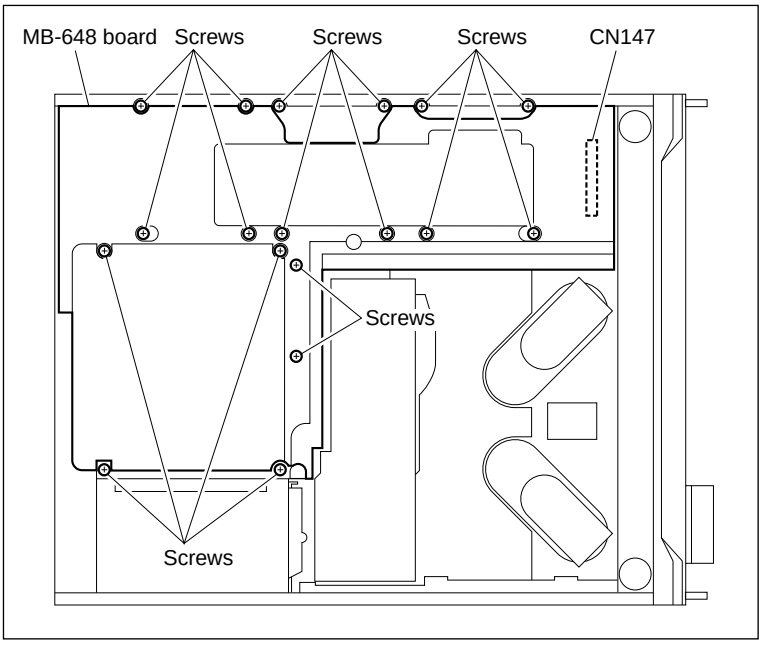
Note

Be sure to put the removed hard disk drive unit on the HDD cushion.

21. Disconnect the harnesses and flat cable from the connectors CN140, CN144, CN151, CN152, CN154, CN161, and CN162 on the MB-648 board.



22. Remove the eighteen screws and remove the MB-648 board.
23. Disconnect the flat cable from the connector (CN147) on the MB-648 board.



24. Install the MB-648 board in the reverse order of steps 2 through 23.
25. Turn the power on and confirm the unit runs in normal condition.

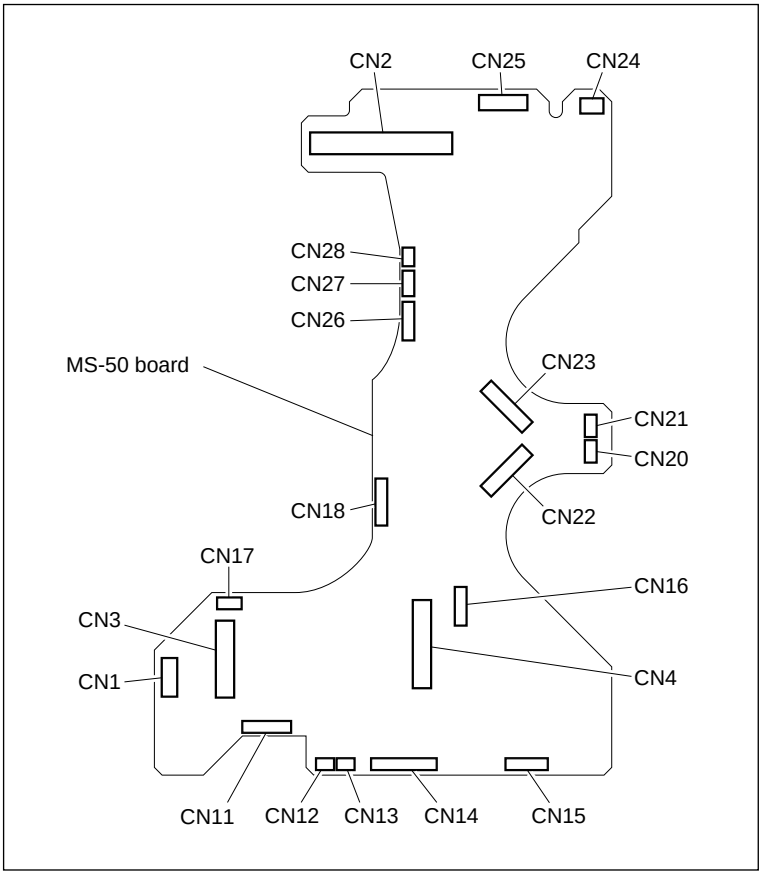
5-32-10. MS-50 Board

Note

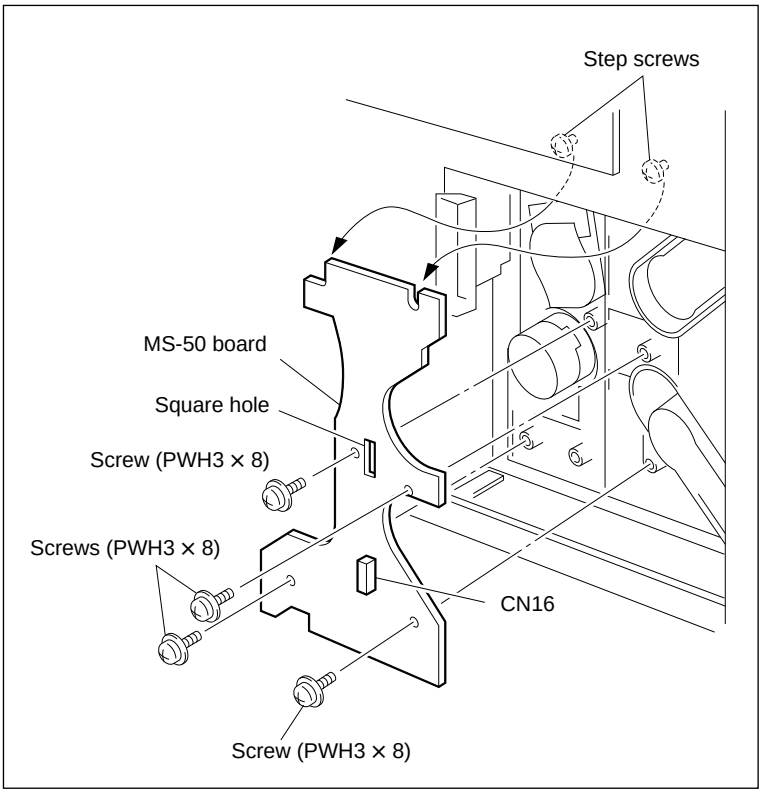
When replacing the MS-50 board, the hard disk drive unit has to be removed. The handling of the removed hard disk drive unit should be complied with “Caution for Handling the Unit with Build-in HDDs “ (described after Manual Structure), and perform operations with extra care not to apply any shocks to the hard disk drive unit.

Replacement

1. Turn off the power.
2. Remove the DR-315 board.
   (Refer to Section 5-32-6.)
3. Disconnect the harnesses, flat cable, and flexible card wires from the connectors CN1, CN2, CN3, CN4, CN11, CN12, CN13, CN14, CN15, CN16, CN17, CN18, CN20, CN21, CN22, CN23, CN24, CN25, CN26, CN27, and CN28 on MS-50 board.



4. Remove the four screws as shown in the figure.
5. Slide the MS-50 board toward the right side panel, and take off the upper side of MS-50 board from the two step screws.



6. Install the MS-50 board in the reverse order of steps 2 through 5.

Note

The MC sensor harness (connected to the connector CN16 on the MS-50 board) requires to thread in the square hole on the center portion of the MS-50 board.

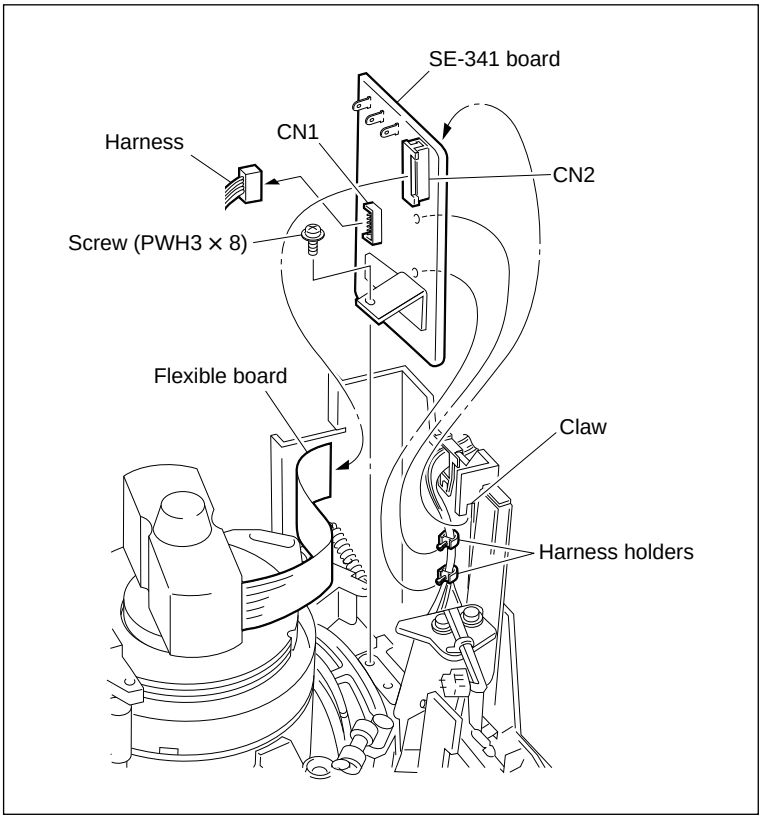
Adjustment after Replacement

7. Perform the all of servo system electrical adjustment.
   (Refer to Section 3-4.)

5-32-11. SE-341 Board

Replacement

1. Turn off the power.
2. Remove the upper lid.
   (Refer to Section 2-3-1 in Maintenance Manual Part 1.)
3. Remove the plate MD assembly.
   (Refer to Section 2-4 in Maintenance Manual Part 1.)
4. Disconnect the harness and flexible board from the connectors (CN1 and CN2) on the SE-341 board.
5. Remove the harness holders by pushing out each insersion part of them using a pair of long-nose pliers, etc. from the SE-341 board.
6. Remove the screw and slide the SE-341 board to unlock from the claw, then remove the SE-341 board.



7. Install the SE-341 board in the order of steps 5, 6, 4, 3, and 2.

Adjustment after Replacement

8. Confirm that the condensation (DEW) sensor operates normally. (Refer to Section 4-2-2 in Maintenance Manual Part 1.)
   (C003: DEW SENSOR)

5-32-12. SE-378 Board

Note

When replacing the SE-378 board, the hard disk drive unit has to be removed. The handling of the removed hard disk drive unit should be complied with “Caution for Handling the Unit with Build-in HDDs “ (described after Manual Structure), and perform operations with extra care not to apply any shocks to the hard disk drive unit.

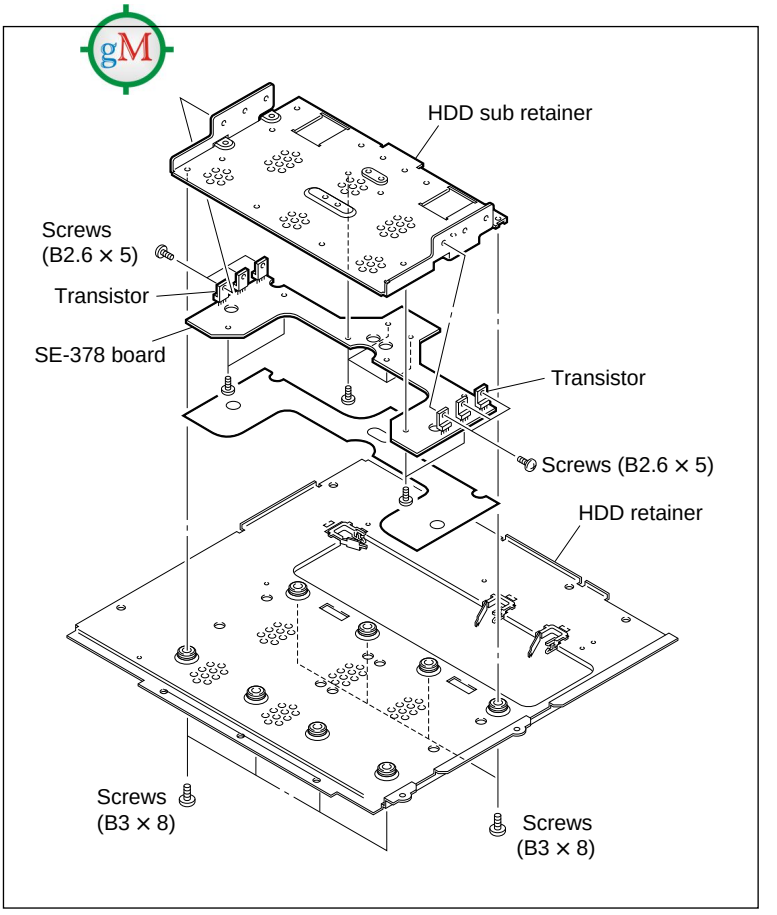
Replacement

1. Turn off the power.
2. Remove the hard disk drive unit.
   (Refer to Section 5-31-2.)

   Note

   Be sure to put the removed hard disk drive unit on the HDD cushion.

3. Remove the hard disk drive from the hard disk drive unit.
   (Refer to Section 5-31-3.)
4. Remove the eight screws (B3 × 8) and remove the HDD sub retainer.
5. Remove the six screws (B2.6 × 5) fixed the transistors.
6. Remove the eight screws shown in the figure, then remove the SE-378 board.



7. Install the SE-378 board in the reverse order of steps 2 through 6.

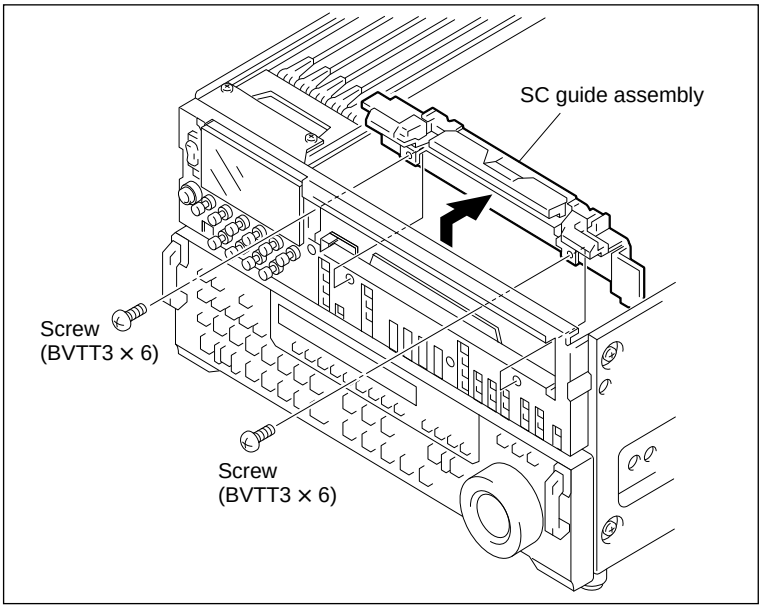
   Notes

   - When installing the SE-378 board to the HDD sub retainer, adjust the position of the SE-378 board so that the six transistors on the both end of the SE-378 board should be contact with the HDD sub retainer closely.
   - Adjustment after replacement is not required.

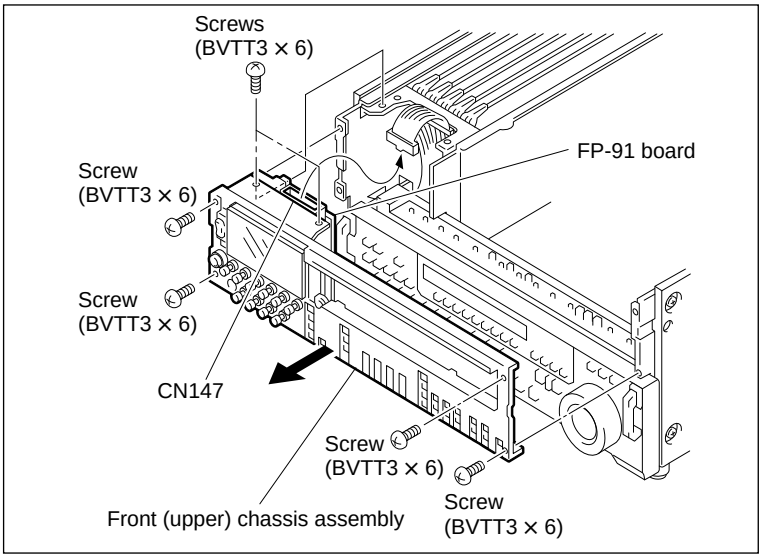
5-32-13. SWC-30 Board

Replacement

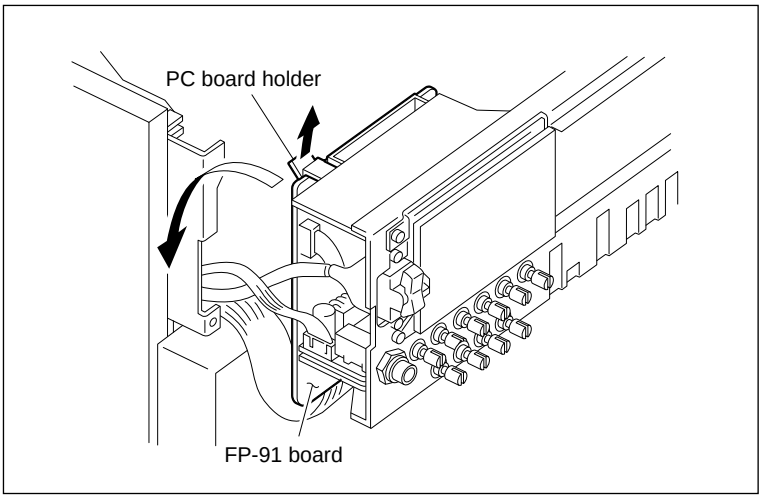
1. Turn off the power.
2. Remove the upper lid.
   (Refer to Section 2-3-1 in Maintenance Manual Part 1.)
3. Remove the plate MD assembly.
   (Refer to Section 2-4 in Maintenance Manual Part 1.)
4. Remove the cassette compartment assembly.
   (Refer to Section 2-5 in Maintenance Manual Part 1.)
5. Remove the upper control panel.
   (Refer to Section 2-3-2 in Maintenance Manual Part 1.)
6. Remove the two screws, then remove the SC guide assembly.



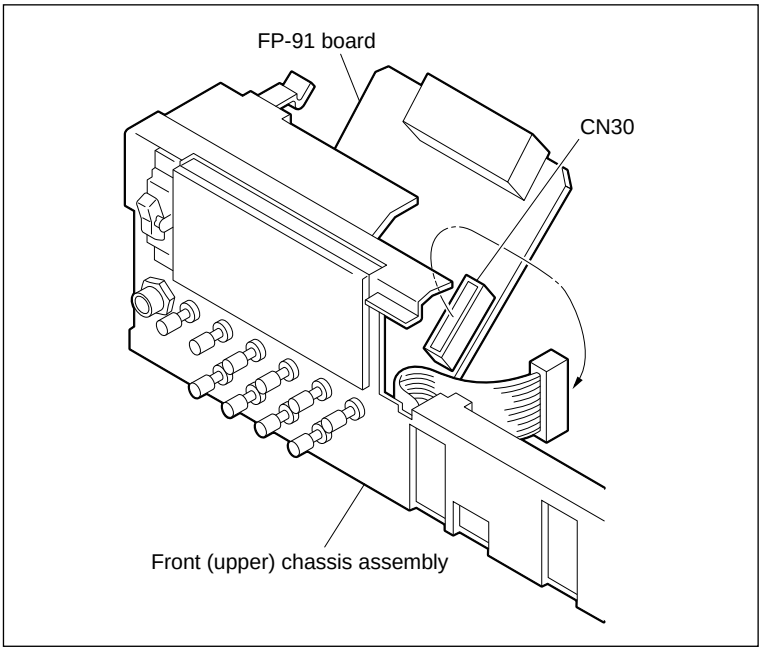
7. Disconnect the flat cable from the connector CN147 on the FP-91 board.
8. Remove the six screws, then pull out the front (upper) chassis assembly.



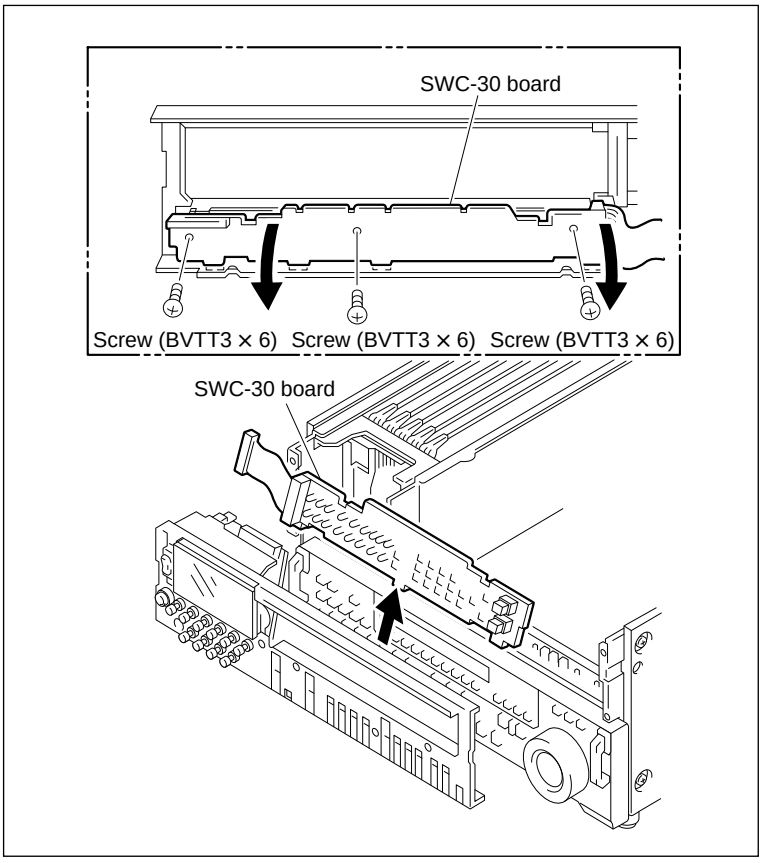
9. Undo the PC board holder, then open the FP-91 board.



10. Disconnect the flat cable from with the connector (CN30) on the FP-91 board.



11. Remove the three screws, then remove the SWC-30 board by lift up the board after inclining to rear.



12. Install the SWC-30 board in the reverse order of steps 2 through 11.

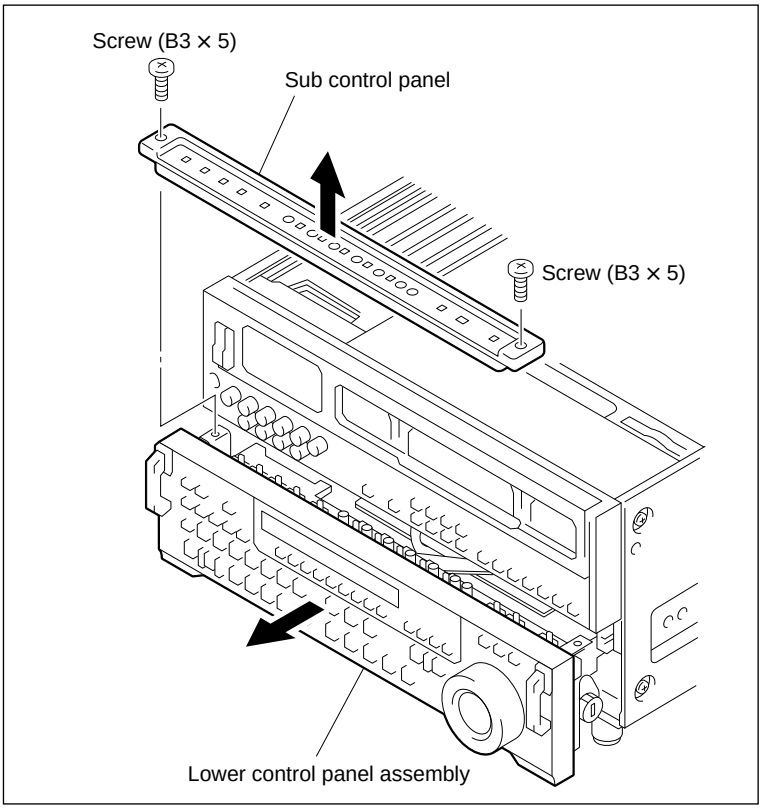
Note

Adjustment after replacement is not required.

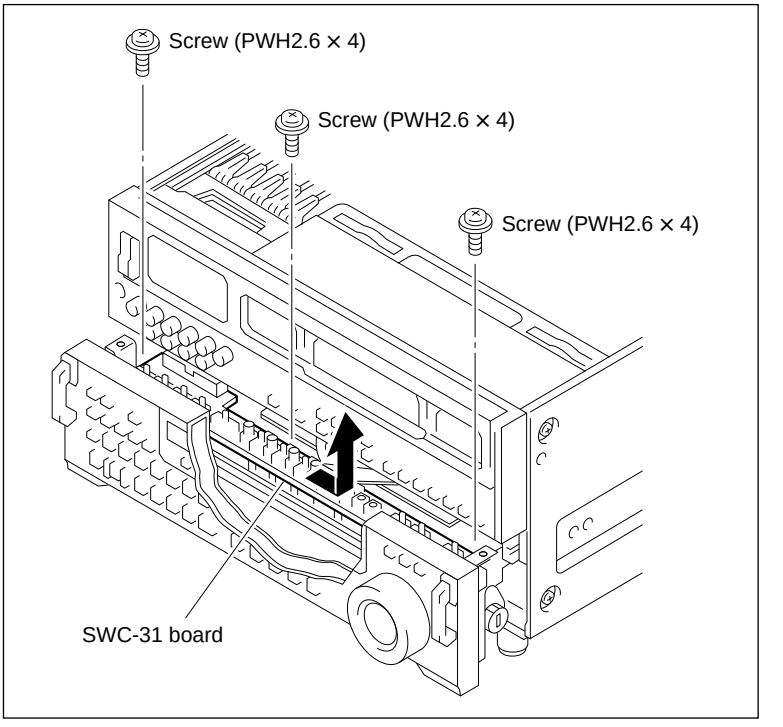
5-32-14. SWC-31 Board

Replacement

1. Turn off the power.
2. Pull out the lower control panel assembly.
3. Remove the two screws, then remove the sub control panel.



4. Remove the three screws.
5. Unlock the SWC-31 board by sliding it in the direction of the arrow, then remove the board.



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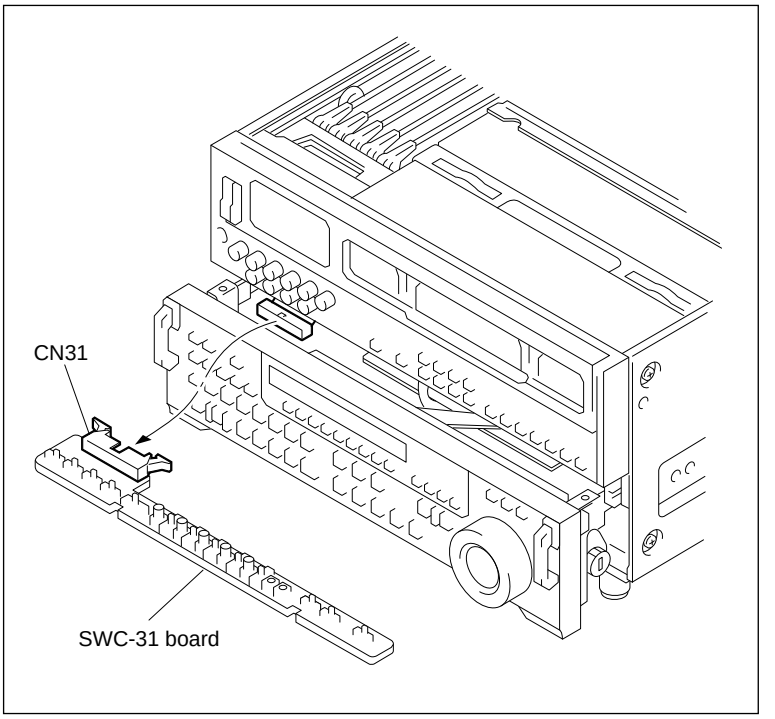
6. Disconnect the flat cable from the connector (CN31).
   Then remove the SWC-31 board.



7. Install the SWC-31 board in the reverse order of steps 2 through 6.

Notes

- Adjustment after replacement is not required.
- When this unit is connected with the analog switcher, perform the system phase adjustment again following the manual of the analog switcher.

System Phase Adjustment

The system phase of this unit is adjusted by using the SYNC control and SC control of SYSTEM PHASE on the sub control panel.

Notes

- Be sure to adjust in PB mode.
  The system phase does not change even if the SYNC/SC control is turned in the REC mode, but it changes when the REC mode is shifted to the PB mode.
- The playback sound may be momentarily interrupted when the SYNC/SC control is turned during tape playback.

5-32-15. TC-96 Board

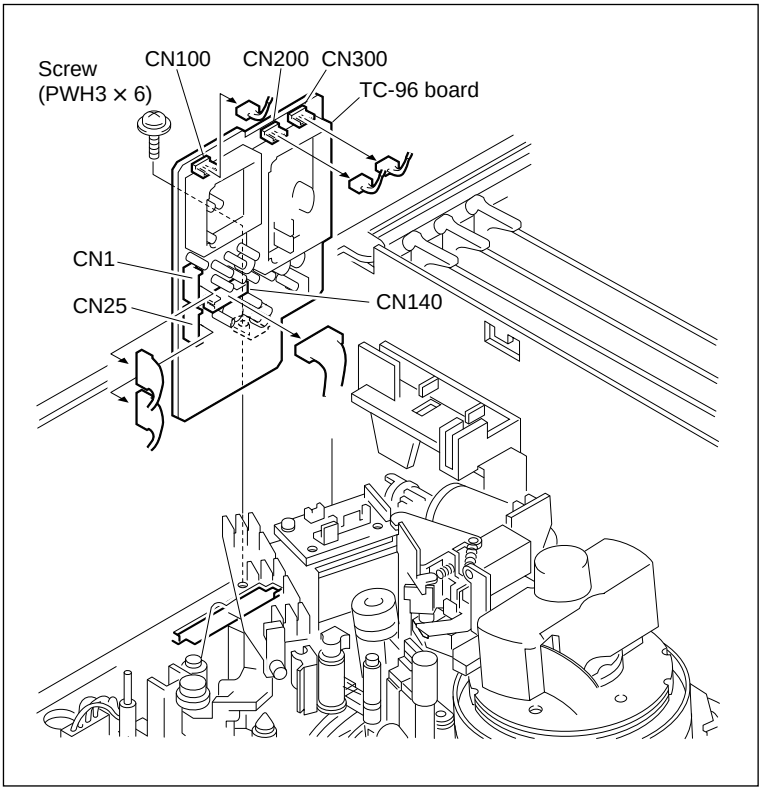
Replacement

1. Turn off the power.
2. Remove the upper lid.
   (Refer to Section 2-3-1 in Maintenance Manual Part 1.)
3. Remove the plate MD assembly.
   (Refer to Section 2-4 in Maintenance Manual Part 1.)
4. Remove the screw as shown in the figure.

   Note

   Pay attention not to fall the screw upon the mechanical deck.

5. Lifting the TC-96 board, and disconnect the harnesses from the connectors (CN100, CN200, CN300, CN1, CN25, and CN140) on the TC-96 board.
   Then remove the TC-96 board.



6. Install the TC-96 board in the reverse order of steps 2 through 5.

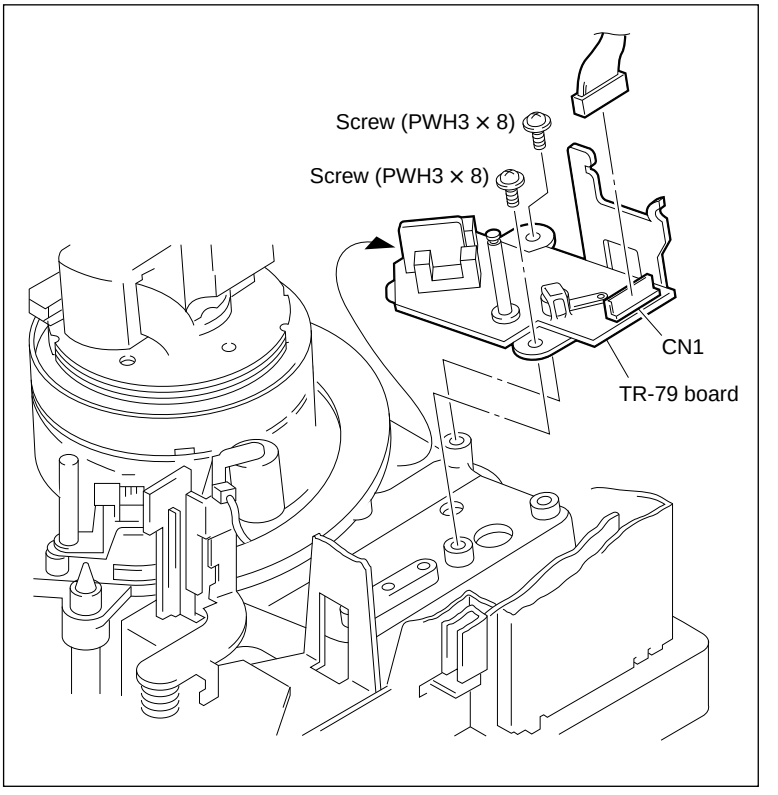
Adjustment after Replacement

7. Perform the electrical adjustments or checks of the time code system.
   (Refer to Section 3-11.)

5-32-16. TR-79 Board

Replacement

1. Turn off the power.
2. Remove the upper lid.
   (Refer to Section 2-3-1 in Maintenance Manual Part 1.)
3. Remove the plate MD assembly.
   (Refer to Section 2-4 in Maintenance Manual Part 1.)
4. Remove the T tension arm assembly.
   (Refer to Section 5-17.)
5. Disconnect the harness from the connector (CN1) on the TR-79 board.
6. Remove the two screws, then remove the TR-79 board.



7. Install the TR-79 board in the reverse order of steps 2 through 6.

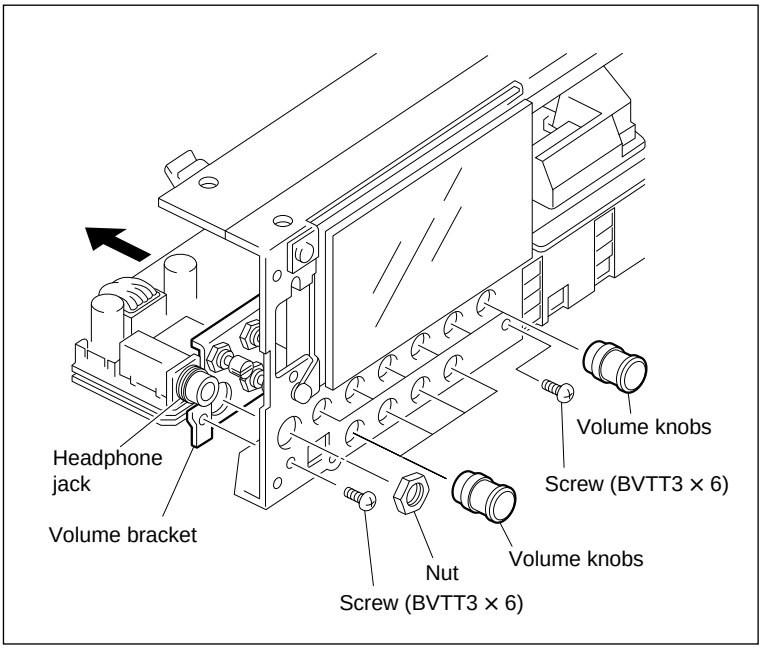
Adjustment after Replacement

8. Perform the tension offset adjustment.
   Refer to Section 4-2-7 in Maintenance Manual Part 1.
   (A008: S/T TENSION OFFSET)

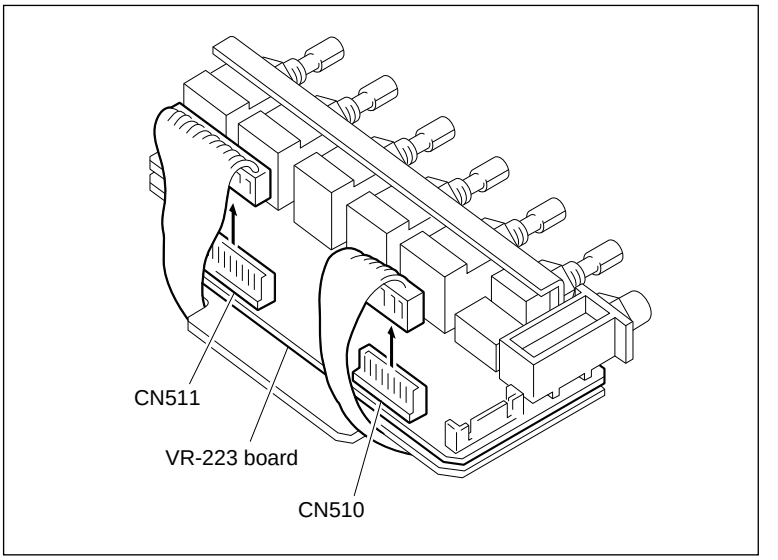
5-32-17. VR-223 Board

Replacement

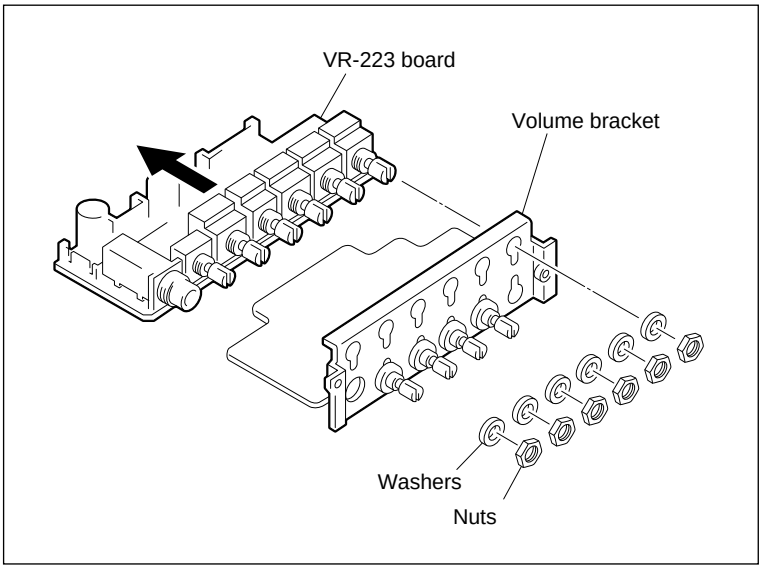
1. Turn off the power.
2. Remove the upper lid.
   (Refer to Section 2-3-1 in Maintenance Manual Part 1.)
3. Remove the plate MD assembly.
   (Refer to Section 2-4 in Maintenance Manual Part 1.)
4. Remove the cassette compartment assembly.
   (Refer to Section 2-5 in Maintenance Manual Part 1.)
5. Remove the upper control panel.
   (Refer to Section 2-3-2 in Maintenance Manual Part 1.)
6. Remove the FP-91 board.
   (Refer to Section 5-32-7.)
7. Remove the ten volume knobs.
8. Remove the nut of the headphone jack.
9. Remove the two screws, and remove the volume bracket.



10. Disconnect the hernesses from the connectors (CN510 and CN511).



11. Remove the six nuts and washers, and remove the VR-223 board.



12. Install the VR-223 board in the reverse order of steps 2 through 11.

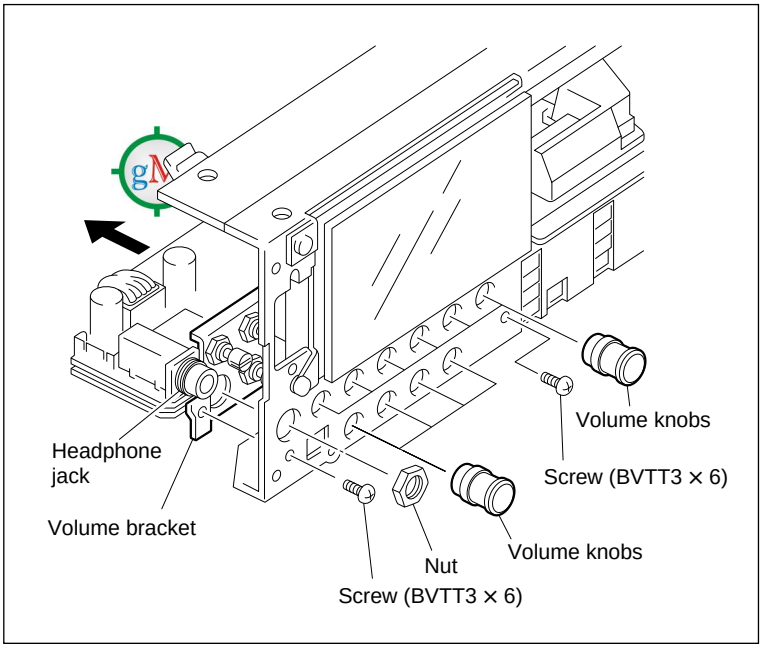
Notes

- After tightening the nuts, apply locking compound.
- Adjustment after replacement is not required.

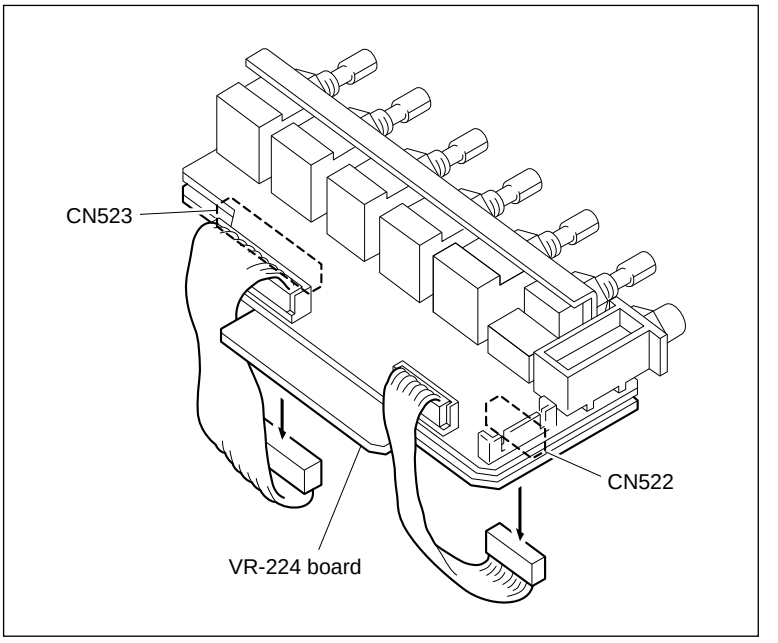
5-32-18. VR-224 Board

Replacement

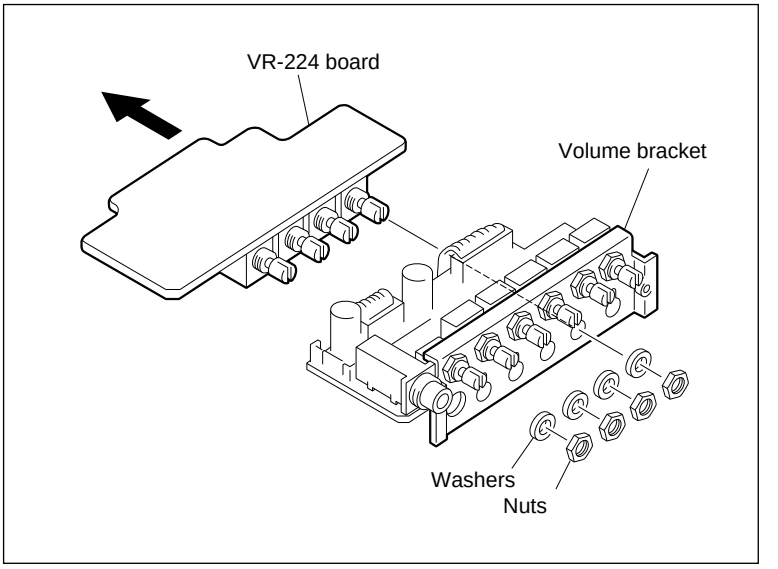
1. Turn off the power.
2. Remove the upper lid.
   (Refer to Section 2-3-1 in Maintenance Manual Part 1.)
3. Remove the plate MD assembly.
   (Refer to Section 2-4 in Maintenance Manual Part 1.)
4. Remove the cassette compartment assembly.
   (Refer to Section 2-5 in Maintenance Manual Part 1.)
5. Remove the upper control panel.
   (Refer to Section 2-3-2 in Maintenance Manual Part 1.)
6. Remove the FP-91 board.
   (Refer to Section 5-32-7.)
7. Remove the ten volume knobs.
8. Remove the nut of the headphone jack.
9. Remove the two screws, and remove the volume bracket.



10. Disconnect the harnesses from the connectors (CN522 and CN523).



11. Remove the four nuts and washers, and remove the VR-224 board.



12. Install the VR-224 board in the reverse order of steps 2 through 11.

Notes

- After tightening the nuts, apply locking compound.
- Adjustment after replacement is not required.

Section 6
Electrical Alignment after Replacement of Main Parts

6-1. General Information for Electrical Alignment

In Section 6 explains the electrical alignment after replacing the following parts.

- Drum assembly / Upper drum assembly ..... Sections 6-2 and 6-3.
- AT head ..... Section 6-4.

6-1-1. Notes on Electrical Alignment

- Never touch (or turn) the adjustment parts which are not described in Section 6.
  If turned once, the parts require the electrical adjustments that are described in Section 3.
- Do not execute adjustment items nor change data in the maintenance mode which are not described in Section 6.
  If executed or changed carelessly, turn off the power of the DNW or execute “ALL DATA PREVIOUS” in each NV-RAM control menu so as not to save the data. (Never execute “SAVE ALL ADJUST DATA” in each NV-RAM control menu.)

Note

NV-RAM control menu for the servo system have no function “ALL DATA PREVIOUS”.
If executed carelessly the automatic adjustment, turn off the power of the VTR.

6-1-2. Equipment and Tools Required

Measuring equipment, signal generators, and tools required in Section 6 are listed in this section.

For DNW-A100/A50/A45

Component video signal generator	TEKTRONIX TSG-300 or equivalent	
Composite video signal generator	TEKTRONIX TSG-170A or equivalent	
Component waveform monitor	TEKTRONIX WFM300 or equivalent	
Composite waveform/vector monitor	TEKTRONIX 1750 or 1780R or equivalent	
Oscilloscope	TEKTRONIX 2465B or equivalent	
Spectrum analyzer	ADVANTEST R3261A or equivalent	
Network analyzer	ANRITSU MS420B or equivalent	
Audio signal generator	TEKTRONIX SG505-option 02 or equivalent	
Audio analyzer	TEKTRONIX AA501A-option 02 or equivalent	
Audio level meter	HEWLETT-PACKARD HP3400A or equivalent	
Digital voltmeter	ADVANTEST TR6845 or equivalent	
Extension boards	EX-377	(SONY part No. J-6269-810-A)
	EX-556	(SONY part No. A-8277-212-A)
Extension harness	14P	(SONY part No. 1-952-684-11)
Composite video monitor	For 525/60 (NTSC) system	
	For 625/50 (PAL) system (Note	
Terminator	75 Ω, BNC	
Cleaning tape	BCT-5CLN	(SONY standard product)
Alignment tapes	CR5-1B	(SONY part No. 8-960-096-41)
	CR5-2A	(SONY part No. 8-960-097-44)
	CR8-1A	(SONY part No. 8-960-097-45)
	SR2-1	(SONY part No. 8-960-075-11)
	SR2-1P	(SONY part No. 8-960-075-61)
	SR5-1	(SONY part No. 8-960-075-01)
Recording tape	Betacam SX Tape (SONY standard product)	

Note

When using the DNW-A100/A50/A45 in 625/50 mode, the Drum Phase adjustment procedure differs from that in 525/60 mode. And the composite video monitor for 625/50 system is required at the time.

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For DNW-A100P/A50P/A45P

Component video signal generator	TEKTRONIX TSG-300 or equivalent	
Composite video signal generator	TEKTRONIX TSG-271 or equivalent	
	TEKTRONIX 1411 or equivalent	
Component waveform monitor	TEKTRONIX WFM300 or equivalent	
Composite waveform/vector monitor	TEKTRONIX 1751 or 1781R or equivalent	
Oscilloscope	TEKTRONIX 2465B or equivalent	
Spectrum analyzer	ADVANTEST R3261A or equivalent	
Network analyzer	ANRITSU MS420B or equivalent	
Audio signal generator	TEKTRONIX SG505-option 02 or equivalent	
Audio analyzer	TEKTRONIX AA501A-option 02 or equivalent	
Audio level meter	HEWLETT-PACKARD HP3400A or equivalent	
Frequency counter	ADVANTEST TR5821AK or equivalent	
Digital voltmeter	ADVANTEST TR6845 or equivalent	
VISC phase adjustment tool		(SONY part No. J-6332-240-A)
Extension boards	EX-377	(SONY part No. J-6269-810-A)
	EX-556	(SONY part No. A-8277-212-A)
Extension harness	14P	(SONY part No. 1-952-684-11)
Composite video monitor	For 625/50 (PAL) system	
	For 525/60 (NTSC) system (Note	
Terminator	75 Ω, BNC	
Cleaning tape	BCT-5CLN	(SONY standard product)
Alignment tapes	CR5-1B PS	(SONY part No. 8-960-096-91)
	CR5-2A PS	(SONY part No. 8-960-098-44)
	CR8-1A PS	(SONY part No. 8-960-098-45)
	CR8-1B PS	(SONY part No. 8-960-096-86)
	SR2-1	(SONY part No. 8-960-075-11)
	SR2-1P	(SONY part No. 8-960-075-61)
	SR5-1P	(SONY part No. 8-960-075-51)
Recording tape	Betacam SX Tape (SONY standard product)	

Note

When using the DNW-A100P/A50P/A45P in 525/60 mode, the Drum Phase adjustment procedure differs from that in 625/50 mode. And the composite video monitor for 525/60 system is required at the time.

6-1-3. Content of Alignment Tapes

This section describes the contents of alignment tapes to be used in Section 6.

CR5-1B (SONY part No. 8-960-096-41): For DNW-A100/A50/A45
CR5-1B PS (SONY part No. 8-960-096-91): For DNW-A100P/A50P/A45P

Time (min. : sec.)	Video	AFM*	LAU tracks	CTL track
0:00 -	RF sweep	No signal	No signal	CTL
2:00 -	60% H sweep (CTDM)	No signal	No signal	CTL
5:00 -	Pulse & Bar (CTDM)	No signal	No signal	CTL
8:00 -	60% multi-burst	No signal	No signal	CTL
11:00 -	Pulse & Bar	No signal	No signal	CTL
14:00 -	CR5-1B: 75% color-bar CR5-1B PS: 100% color-bar	400 kHz sine wave with 25 kHz deviation	No signal	CTL
16:30 -	CR5-1B: 75% color-bar CR5-1B PS: 100% color-bar	400 kHz sine wave with 75 kHz deviation	No signal	CTL
17:00 -	CR5-1B: 50% bowtie & 12.5T CR5-1B PS: 50% bowtie & 10T	No signal	No signal	CTL
19:00 -	Line 17	No signal	No signal	CTL
22:00 -	Quad phase	No signal	No signal	CTL
24:00 -	Flat filed	No signal	No signal	CTL
26:00 -	CR5-1B: 75% color-bars with Drop-out CR5-1B PS: 100% color-bars with Drop-out	No signal	No signal	CTL
28:00 - 30:00	Composite V sweep with VISC	No signal	No signal	CTL

∗: DNW can not playback AFM part.

CR5-2A (SONY part No. 8-960-097-44): For DNW-A100/A50/A45
CR5-2A PS (SONY part No. 8-960-098-44): For DNW-A100P/A50P/A45P

Time (min. : sec.)	Video	LAU tracks	CTL track
0:00 -	CR5-2A: 75% color-bar CR5-2A PS: 100% color-bar	No signal	CTL
3:00 -	60% multi-burst	No signal	CTL
6:00 -	CR5-2A: 50% bowtie & 12.5T CR5-2A PS: 50% bowtie & 10T	No signal	CTL
9:00 -	Pulse & Bar	No signal	CTL
11:00 -	Quad phase	No signal	CTL
13:00 - 15:00	Composite monoscope (Switching position is shifted.)	No signal	CTL

CR8-1A (SONY part No. 8-960-097-45): For DNW-A100/A50/A45
CR8-1A PS (SONY part No. 8-960-098-45): For DNW-A100P/A50P/A45P

Time (min. : sec.)	LAU tracks	CTL track	Video
0:00 -	1 kHz sine wave, 0 VU	CTL	No signal
2:55 -	No signal	CTL	No signal
3:00 -	10 kHz sine wave, −10 VU	CTL	No signal
4:55 -	No signal	CTL	No signal
5:00 -	1 kHz sine wave, −20 VU	CTL	No signal
5:55 -	No signal	CTL	No signal
6:00 -	40 Hz sine wave, −20 VU	CTL	No signal
6:25 -	No signal	CTL	No signal
6:30 -	7 kHz sine wave, −20 VU	CTL	No signal
6:55 -	No signal	CTL	No signal
7:00 -	10 kHz sine wave, −20 VU	CTL	No signal
7:25 -	No signal	CTL	No signal
7:30 -	15 kHz sine wave, −20 VU	CTL	No signal
7:55 -	No signal	CTL	No signal
8:00 - 10:00	1 kHz sine wave, 0 VU	1 kHz sin wave, 0VU	No signal

CR8-1B PS (SONY part No. 8-960-096-86): For DNW-A100P/A50P/A45P only

Time (min. : sec.)	LAU tracks	CTL track	Video
0:00 -	1 kHz sine wave, 0 VU	CTL	Black burst
2:55 -	No signal	CTL	Black burst
3:00 -	15 kHz sine wave, 0 VU	CTL	Black burst
4:55 -	No signal	CTL	Black burst
5:00 -	1 kHz sine wave, −20 VU	CTL	Black burst
5:55 -	No signal	CTL	Black burst
6:00 -	40 Hz sine wave, −20 VU	CTL	Black burst
6:25 -	No signal	CTL	Black burst
6:30 -	7 kHz sine wave, −20 VU	CTL	Black burst
6:55 -	No signal	CTL	Black burst
7:00 -	10 kHz sine wave, −20 VU	CTL	Black burst
7:25 -	No signal	CTL	Black burst
7:30 -	15 kHz sine wave, −20 VU	CTL	Black burst
7:55 -	No signal	CTL	Black burst
8:00 - 10:00	1 kHz sine wave, 0 VU	1 kHz sine wave	No signal

SR2-1 (SONY part No. 8-960-075-11): For 525/60 line System
SR2-1P (SONY part No. 8-960-075-61): For 625/50 line System

Time (min. : sec.)	Digital video	Digital audio	CTL track
0:00 - (Pulse*)	3.212 MHz (A CH only)	SR2-1: 3 KHz, 0 VU SR2-1P: 3.15 kHz, 0 VU	CTL
15:00 -	A CH : 3.212 MHz B CH : 6.424 MHz	SR2-1: 3 KHz, 0 VU SR2-1P: 3.15 kHz, 0 VU	CTL
20:00 -	12.848 MHz (All CH)	SR2-1: 3 KHz, 0 VU SR2-1P: 3.15 kHz, 0 VU	CTL
25:00 - 27:00	100 % Color Bars (All CH)	SR2-1: 3 KHz, 0 VU SR2-1P: 3.15 kHz, 0 VU	CTL

*) When the pulse portion (00:00 to 15:00) is played back, the TC data interpolated by CTL signal is displayed because no data is recorded on the time code track.

SR5-1 (SONY part No. 8-960-075-01): For DNW-A100/A50/A45
SR5-1P (SONY part No. 8-960-075-51): For DNW-A100P/A50P/A45P

Time (min. : sec.)	Digital video	Digital audio	CTL track
0:00 -	100% color-bar	1 kHz sine wave, –20 dB FS	CTL
2:00 -	100% color-bar	1 kHz sine wave, 0 dB FS	CTL
4:00 -	100% color-bar	–∞ dB FS	CTL
6:00 -	100% color-bar	20 Hz sine wave, –20 dB FS	CTL
8:00 -	100% color-bar	20 kHz sine wave, –20 dB FS	CTL
10:00 -	Ramp	1 kHz sine wave, –20 dB FS	CTL
12:00 -	Ramp	1 kHz sine wave, 0 dB FS	CTL
14:00 -	Ramp	–∞ dB FS	CTL
16:00 -	Ramp	20 Hz sine wave, –20 dB FS	CTL
18:00 -	Ramp	20 kHz sine wave, –20 dB FS	CTL
20:00 -	100% color-bar	1 kHz sine wave, –20 dB FS	CTL
22:00 -	100% color-bar	1 kHz sine wave, 0 dB FS	CTL
24:00 -	100% color-bar	–∞ dB FS	CTL
26:00 -	100% color-bar	20 Hz sine wave, –20 dB FS	CTL
28:00 - 30:00	100% color-bar	20 kHz sine wave, –20 dB FS	CTL

6-2. Servo/EQ Alignment after Replacing the Drum

Adjustment Items

No.	Item		Adjustment point	Remarks
1	Drum Phase adjustment			
		525/60:	A011 : RF SWITCHING POS.	Alignment Tape SR2-1
		Data save	A012 : NV-RAM CONTROL	
		625/50:	A011 : RF SWITCHING POS.	Alignment Tape SR2-1P
		Data save	A012 : NV-RAM CONTROL	
2	PB Equalizer adjustment			
		DNW-A100/A100P:	A10 : EQUALIZER(1/2)	
		DNW-A100/A100P DNW-A50/A45/A50P/A45P:	A11 : EQUALIZER(2/2) A11 : EQUALIZER	
3	REC Current adjustment		A12 : REC CURRENT	
		Data save	A1F : NV-RAM CONTROL	

Maintenance Mode

The operation of the maintenance mode describes as follows.

Entering the maintenance mode

Press S1101(G-1) on the SS-63 board.

Shifting the next menu

(1) Press the JOG button. = **Search dial enters the JOG mode.**
(2) Turn the search dial to set the cursor ∗ to the desired menu (or mode) .
(3) Press the SET button once.

Exiting from the current menu (or mode)

Press the MENU button once.

Note

Press the MENU button several times to exit from the maintenance mode.

Saving the data

(1) Turn the search dial to set the cursor ∗ to A??? : NV-RAM CONTROL (A012 or A1F) .
(2) Press the SET button once.
(3) Turn the search dial to set the cursor ∗ to “SAVE ALL ADJUST DATA”.
(4) Press the SET button once.

Preparation

(1) Connect the video monitor to the VIDEO OUTPUT COMPOSITE 3 connector.
(2) Wait 20 minutes or more after turning on the power.

6-2-1. Drum Phase Adjustment

For 525/60 Video System

1. Select the 525/60 system for the unit.
   If the 625/50 system is selected, switch the unit to the 525/60 system by setting basic menu item 013, 525/625 SYSTEM SELECT referring to the operation manual, Section 7-2-2. Then turn the power off and on again.
   Important
   Switching the system results in all signal data on the disk being lost.
2. Prepare the alignment tape SR2-1 which was cued up to 00:25:00:00 of time-code in advance.
3. Press S1101 on the SS-63 board to enter the maintenance mode.
4. Select M0:TAPE MAINTENANCE.
5. Select A0:SERVO ADJUST.
6. Select A00-01:SERVO ADJUST.
   • An inserted tape will be ejected automatically at the time.
7. Select A011:RF SWITCHING POS..
8. Select AUTO by shifting the cursor ∗.
9. Insert the SR2-1 and press SET button. Then;
   • Automatic drum phase adjustment will be started.
   • After the adjustment is normally completed, the message “ADJUST COMPLETE” will be displayed on the video monitor.
10. Press the MENU button to return to SERVO ADJUST display.
11. Select A012:NV-RAM CONTROL.
12. Execute “SAVE ALL ADJUST DATA”.
    • After saving operation is normally completed, the message “DATA SAVED” will be displayed on the video monitor.

For 625/50 Video System

13. Switch the unit to the 625/50 system by setting basic menu item 013, 525/625 SYSTEM SELECT referring to the operation manual, Section 7-2-2. Then turn the power off and on again.
14. Prepare the alignment tape SR2-1P which was cued up to 00:25:00:00 of time-code in advance.
15. Press S1101 on the SS-63 board to enter the maintenance mode.
16. Select M0:TAPE MAINTENANCE.
17. Select A0:SERVO ADJUST.
18. Select A00-01:SERVO ADJUST.
    • An inserted tape will be ejected automatically at the time.
19. Select A011:RF SWITCHING POS..
20. Select AUTO by shifting the cursor ∗.
21. Insert the SR2-1P and press SET button. Then;
    • Automatic drum phase adjustment will be started.
    • After the adjustment is normally completed, the message “ADJUST COMPLETE” will be displayed on the video monitor.
22. Press the MENU button to return to SERVO ADJUST display.
23. Select A012:NV-RAM CONTROL.
24. Execute “SAVE ALL ADJUST DATA”.
    • After saving operation is normally completed, the message “DATA SAVED” will be displayed on the video monitor.
25. Return the unit to its normal system by setting basic menu item 013, 525/625 SYSTEM SELECT.

6-2-2. PB Equalizer Adjustment

1. Prepare the alignment tape SR5-1/SR5-1P.
2. Press S1101 on the SS-63 board to enter the maintenance mode.
3. Select M0:TAPE MAINTENANCE.
4. Select A1:RF ADJUST.

For the DNW-A50/A50P/A45/A45P, skip steps 5 to 7 and carry out steps 8 and later.

5. Select A10:EQUALIZER(1/2) and select ALL by shifting the cursor ∗.
6. Press SET button. Then;
   • Automatic PB equalizer adjustment will be started.
   • After the adjustment is normally completed, the message “Auto Adjust Complete” will be displayed on the video monitor.
7. Press the MENU button to return to RF ADJUST MODE display.
8. Select A11:EQUALIZER(2/2) and select ALL by shifting the cursor ∗.
   (The menu of the DNW-A50/A50P/A45/A45P displays “A11:EQUALIZER”.)
9. Press SET button. Then;
   • Automatic PB equalizer adjustment will be started.
   • After the adjustment is normally completed, the message “Auto Adjust Complete” will be displayed on the video monitor.
10. Press the MENU button to return to RF ADJUST MODE display.

Perform Section 6-2-3. “Recording Current Adjustment” following the completion of this adjustment.

6-2-3. Recording Current Adjustment

1. Select A12:REC CURRENT.
2. Select AUTO by shifting the cursor ∗ in A12:REC CURRENT menu.
3. Press SET button.
   • An inserted alignment tape will be ejected automatically at the time.
   • The message “Insert Blank Tape” will be displayed on the video monitor.
4. Insert a recording tape. Then;
   • Automatic recording current adjustment will be started.
   • After the adjustment is normally completed, the message “Auto Adjust Complete” will be displayed on the video monitor.
5. Return to the operation mode by pressing MENU button four times.
6. Eject the recording tape.
7. Press S1101 on the SS-63 board to enter the maintenance mode.
8. Select M0: TAPE MAINTENANCE.
9. Select A1: RF ADJUST.
10. Select A1F: NV-RAM CONTROL.
11. Execute “SAVE ALL ADJUST DATA”.
    • After saving operation is normally completed, the message “Save Complete” will be displayed on the video monitor.
12. Return to the operation mode by pressing MENU button four times.

6-3. Analog Video Playback System Adjustment after Replacing the Drum

Adjustment Items

No.	Item		Adjustment point	Notes
1	Preparation			
2	EQ RF output level adjustment			
		METAL Y	A30 : EQ VR : RF GAIN METAL-Y-A A30 : EQ VR : RF GAIN METAL-Y-B	TP100/DM-89
		METAL C	A30 : EQ VR : RF GAIN METAL-C-A A30 : EQ VR : RF GAIN METAL-C-B	TP300/DM-89
		OXIDE C	A30 : EQ VR : RF GAIN OXIDE-C-A A30 : EQ VR : RF GAIN OXIDE-C-B	TP300/DM-89
		OXIDE Y	A30 : EQ VR : RF GAIN OXIDE-Y-A A30 : EQ VR : RF GAIN OXIDE-Y-B	TP100/DM-89
		Saving data	A3F : NV-RAM CONTROL	
3	DM RF output level pre-adjustment			
		METAL Y	⊘RV211/DM-89	TP3/DM-89
		METAL C	⊘RV406/DM-89	TP7/DM-89
		OXIDE C	⊘RV407/DM-89	TP7/DM-89
		OXIDE Y	⊘RV212/DM-89	TP3/DM-89
4	OMC carrier balance adjustment			
		OXIDE Y	⊘RV107/DM-89, ⊘RV108/DM-89	TP105/DM-89
		OXIDE C	⊘RV307/DM-89, ⊘RV308/DM-89	TP305/DM-89
		METAL C	⊘RV305/DM-89, ⊘RV306/DM-89	TP305/DM-89
		METAL Y	⊘RV105/DM-89, ⊘RV106/DM-89	TP105/DM-89
5	OMC carrier balance adjustment (provisional)			
		Note This section explains a provisional adjustment for OMC carrier balance without using a spectrum analyzer, as opposed to the adjustment using the spectrum analyzer described above (No.4). Perform this provisional adjustment only when the spectrum analyzer is not available for an urgent maintenance. Be sure to readjust using the spectrum analyzer at a later date.		
6	Demodulator limiter balance adjustment			
		Y	⊘RV502/DM-89	TP501/DM-89
		C	⊘RV702/DM-89	TP8/DM-89
7	PB frequency response adjustment			
		METAL Y	A32 : DM VR 1 : EQ1 METAL-Y-A A32 : DM VR 1 : EQ1 METAL-Y-B	VIDEO OUTPUT COMPONENT Y
		METAL C	A32 : DM VR 1 : EQ1 METAL-C-A A32 : DM VR 1 : EQ1 METAL-C-B	VIDEO OUTPUT COMPONENT R-Y/B-Y
		OXIDE Y	A32 : DM VR 1 : EQ1 OXIDE-Y-A A32 : DM VR 1 : EQ1 OXIDE-Y-B	VIDEO OUTPUT COMPONENT Y
		OXIDE C	A32 : DM VR 1 : EQ1 OXIDE-C-A A32 : DM VR 1 : EQ1 OXIDE-C-B	VIDEO OUTPUT COMPONENT R-Y/B-Y
		Saving data	A3F : NV-RAM CONTROL	

OMC; Over-Modulation Compensation circuit

(Continued)

(Continued)

No.	Item	Adjustment point		Notes
8	DM RF output level adjustment			
		METAL Y	⊘RV211/DM-89	TP3/DM-89
		METAL C	⊘RV406/DM-89	TP7/DM-89
		OXIDE C	⊘RV407/DM-89	TP7/DM-89
		OXIDE Y	⊘RV212/DM-89	TP3/DM-89
9	RF envelope adjustment			
		Y	⊘RV205/DM-89	TP203/DM-89
		C	⊘RV405/DM-89	TP403/DM-89
10	Impact error offset adjustment			
		Y	⊘RV401/TBC-24	Video monitor
		C	⊘RV601/TBC-24	
11	TBC Y/C delay adjustment			
		METAL	⊘RV500/TBC-24 ⊘RV504/TBC-24 (Note 1)	VIDEO OUTPUT COMPONENT
		OXIDE	⊘RV501/TBC-24	VIDEO OUTPUT COMPONENT

Note 1: RV504 exists on the TBC-24 board with suffix -13 and higher.

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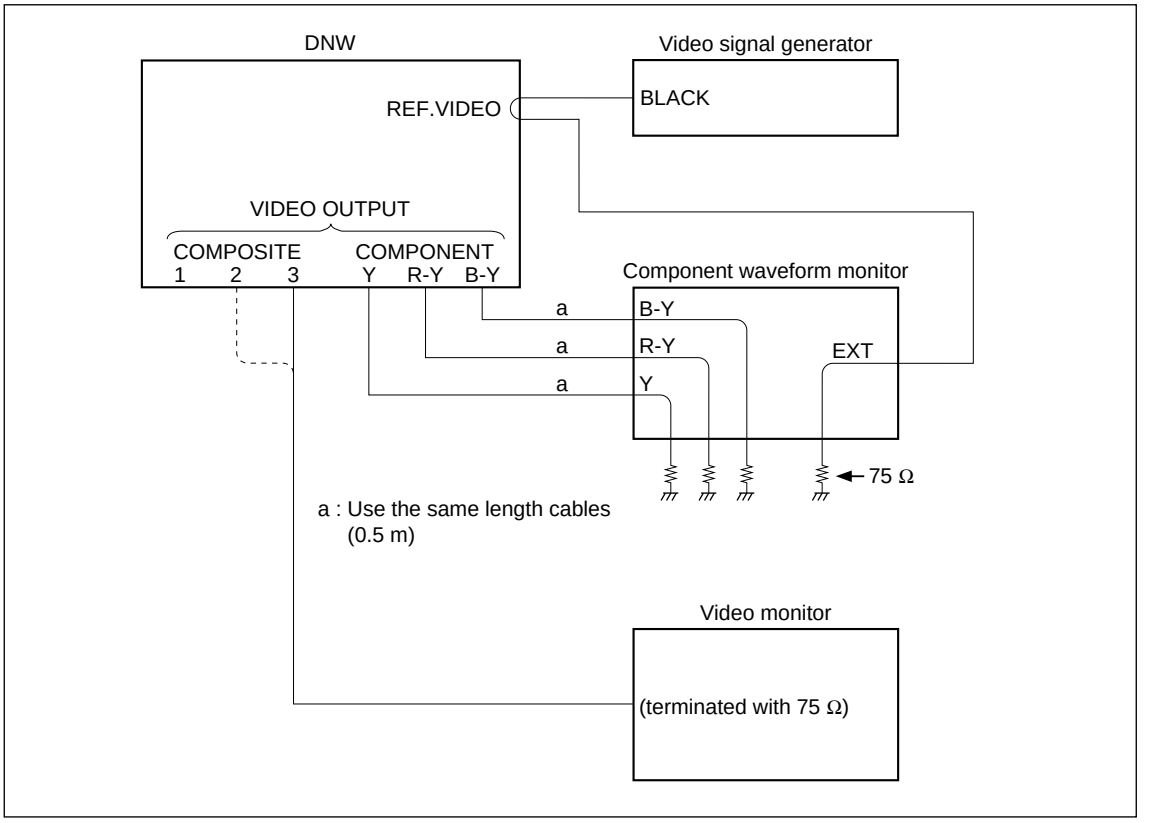
6-3-1. Preparation

1. Connection

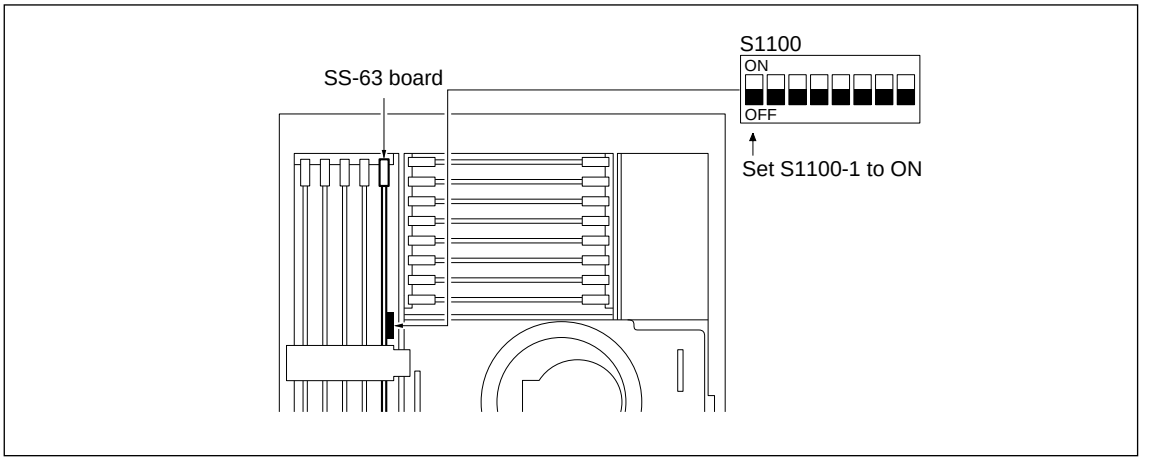
Connect the video signal generator, component waveform monitor, and video monitor as shown below.



2. Extend the DM-89 board with an extension board EX-377.

3. Settings of DNW

(1) Set S1100-1 on SS-63 board to ON to display extended menu of the setup menu.



S1100 of SS-63 Board

(2) Turn on the power, and set switches on each control panel as shown below.

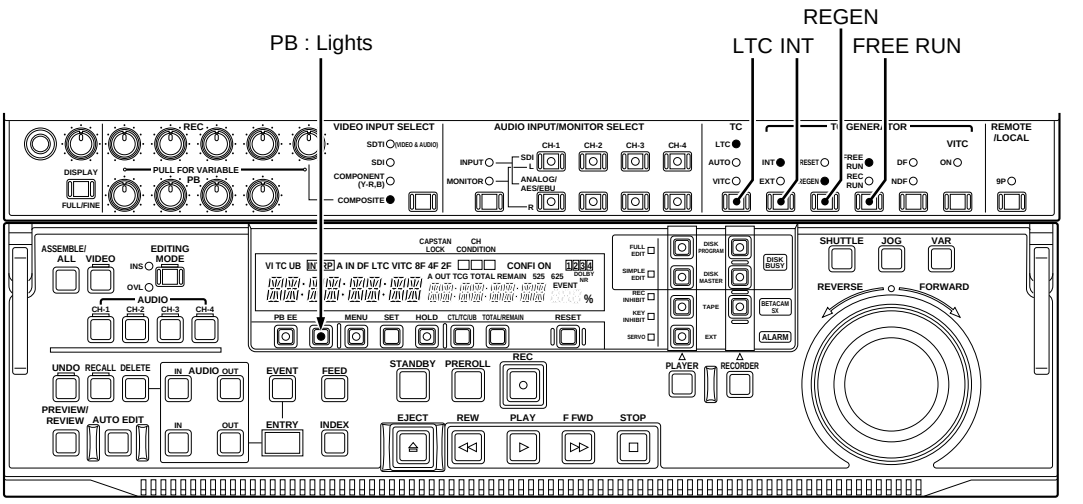


Illustration is DNW-A100/A100P.

Upper/Lower Control Panels

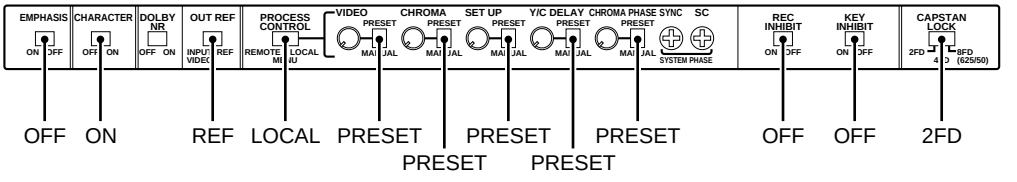


Illustration is DNW-A100/A50/A45.

Sub Control Panel

(3) Setting of the setup extended menu

- For DNW-A100/A50/A45

  Set the SUB-ITEMs of ITEM-709 and ITEM-713 as shown below.

  After adjustments are completed, return the SUB-ITEMs to their previous settings.

ITEM	SUB-ITEM	Setting	Previous setting (fill in)
709 : CAV LEVEL FORMAT	1. OUTPUT CAV LEVEL	B-CAM	
713 : VIDEO SETUP REFERENCE LEVEL	0. MASTER LEVEL	0.0%	
	3. BETACAM PB LEVEL	MSTER	
	4. OUTPUT LEVEL	MSTER	

- For DNW-A100P/A50P/A45P

  No settings required.

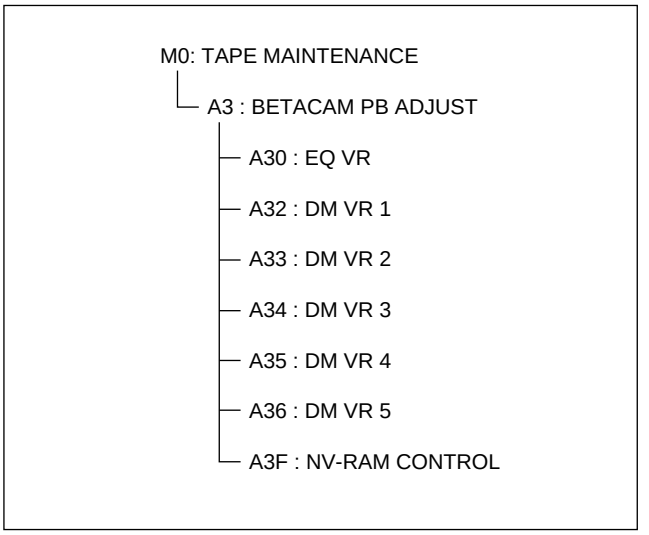
(4) Entering the maintenance mode

To enter the maintenance mode, press S1101 on the SS-63 board.

Notes

The operation of the maintenance mode is described as follows.

The sub mode and menus of the maintenance mode that are used in this section are shown below.



• Shifting to the next menu

(1) Press the JOG button once.
= **Search dial enters into the JOG mode.**

(2) Turn the search dial to set the cursor ∗ to the desired menu (or mode).

(3) Press the SET button once.

• Exiting from the current menu (mode)

Press the MENU button once.

Note

Press the MENU button several times to exit from the maintenance mode .

• Changing the data value

(1) Turn the search dial to set the cursor ∗ to the item to be changed.

(2) Turn the search dial slowly while pressing the JOG button. = **Data value changes.**
REVERSE direction: the data value decreases (FF follows 00.)
FORWARD direction: the data value increases (00 follows FF.)

Note

During adjustment, change the rotational direction of the search dial observing the change of waveform that is displayed on the measuring equipment.

• Saving the data

(1) Turn the search dial to set the cursor ∗ to A3F : NV-RAM CONTROL.

(2) Press the SET button once.

(3) Turn the search dial to set the cursor ∗ to “SAVE ALL ADJUST DATA”.

(4) Press the SET button once.

• Tape operations (playback, rewind, forward, etc.) in the maintenance mode

(1) Enter any of menu A30 to A36.

(2) To pause the maintenance mode operation, press the SET button. = **It enables tape operation.**

Note

The display of the time data display area on the lower control panel is changed to the time code display in the normal operation mode. And the □ mark is displayed at the top right corner of menu screen on the video monitor.

(3) After the tape operation is completed, press the MENU button to cancel the pause of maintenance mode.

Note

The displays of the time data display area and video monitor are returned to their previous states.

6-3-2. EQ RF Output Level Adjustment

Note

Wait 20 minutes or more after turning on the power, then perform the adjustments.

Measuring equipment: Oscilloscope (Band width limit: ON)

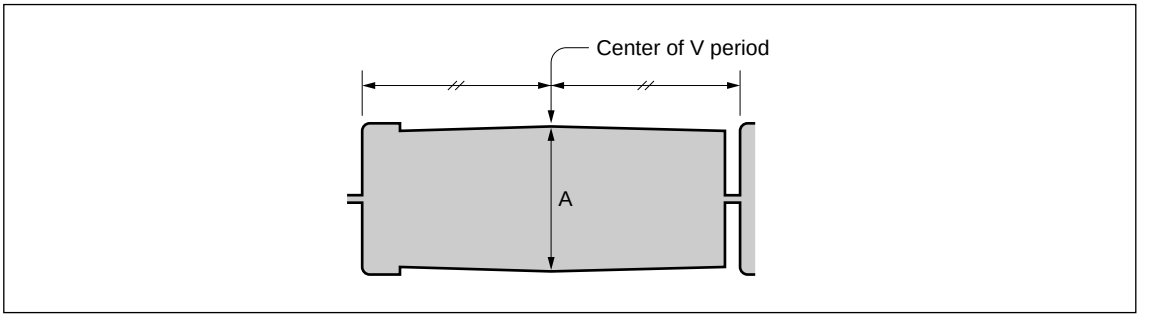
(1) Select A30 : EQ VR of the maintenance mode.
(2) Connect and set the oscilloscope as follows:
CH-1: TP100/DM-89(F-7), AC 100 mV/DIV, 2 ms/DIV, GND: E101/DM-89(F-7)
Trigger: TP4/DM-89(E-1), DC 1 V/DIV, GND: E702/DM-89(D-1)
(3) METAL Y adjustment
Playback the flat field signal portion (24:00 to 26:00) of the alignment tape CR5-1B or CR5-1B PS, and perform the adjustment. (DNW-A100/A50/A45: CR5-1B, DNW-A100P/A50P/A45P: CR5-1B PS)

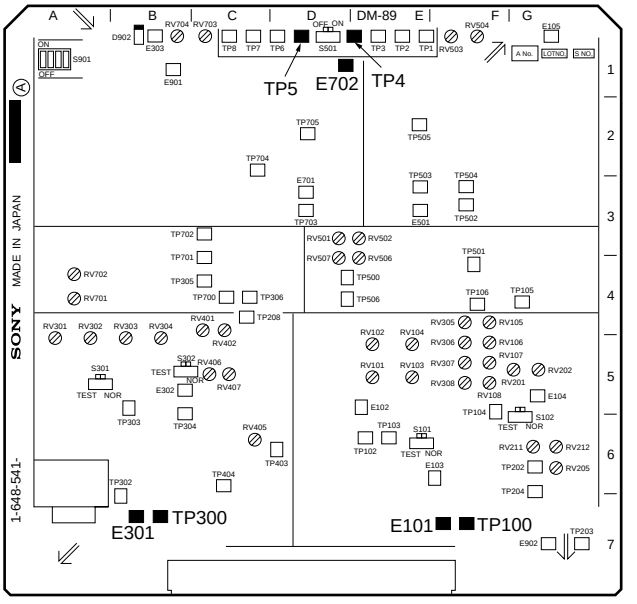
Notes

Adjust respectively for Y-A and Y-B channels.
Observing the Y-A channel, set the trigger of oscilloscope to the negative (−) slope.
Observing the Y-B channel, set the trigger of oscilloscope to the positive (+) slope.

Adjustment points: Y-A channel: A30 : EQ VR : RF GAIN METAL-Y-A
Y-B channel: A30 : EQ VR : RF GAIN METAL-Y-B
Specifications (Y-A and Y-B channels): A = 380 ±20 mV p-p

(4) Stop the playback of the alignment tape CR5-1B/CR5-1B PS.





DM-89 Board (Side A)

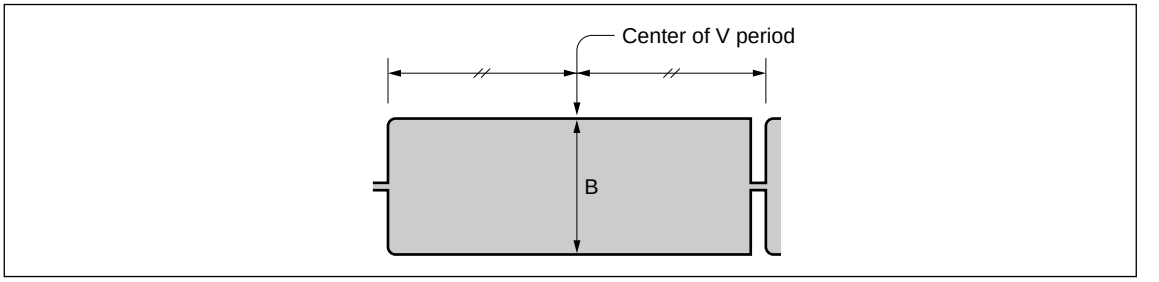
(5) Change the connection of the oscilloscope as follows:
CH-1: TP300/DM-89(B-7), GND: E301/DM-89(B-7)
Trigger: TP5/DM-89(D-1), GND: E702/DM-89(D-1)

(6) METAL C adjustment
Playback the flat field signal portion (24:00 to 26:00) of the alignment tape CR5-1B or CR5-1B PS, and perform the adjustment. (DNW-A100/A50/A45: CR5-1B, DNW-A100P/A50P/A45P: CR5-1B PS)

Note

Adjust respectively for C-A and C-B channels.
Observing the C-A channel, set the trigger of oscilloscope to the negative (−) slope.
Observing the C-B channel, set the trigger of oscilloscope to the positive (+) slope.

Adjustment points: C-A channel: A30 : EQ VR : RF GAIN METAL-C-A
C-B channel: A30 : EQ VR : RF GAIN METAL-C-B
Specifications (C-A and C-B channels): B = 380 ± 20 mV p-p



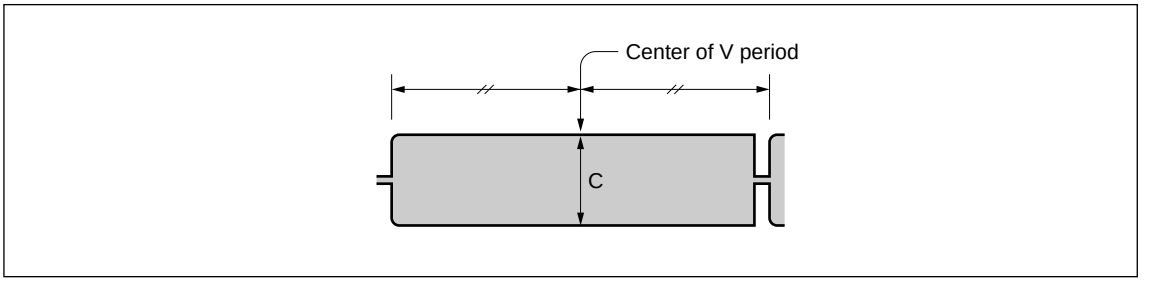
(7) Eject the alignment tape CR5-1B/CR5-1B PS.

(8) OXIDE C adjustment
Playback the 75% color-bar signal portion (0:00 to 3:00) of the alignment tape CR5-2A or CR5-2A PS, and perform the adjustment.
(DNW-A100/A50/A45: CR5-2A, DNW-A100P/A50P/A45P: CR5-2A PS)

Note

Adjust respectively for C-A and C-B channels.
Observing the C-A channel, set the trigger of oscilloscope to the negative (−) slope.
Observing the C-B channel, set the trigger of oscilloscope to the positive (+) slope.

Adjustment points: C-A channel: A30 : EQ VR : RF GAIN OXIDE-C-A
C-B channel: A30 : EQ VR : RF GAIN OXIDE-C-B
Specifications (C-A and C-B channels): C = 250 ± 20 mV p-p



(9) Stop the playback of the alignment tape CR5-2A/CR5-2A PS.

(10) Change the connection of the oscilloscope as follows:
CH-1: TP100/DM-89(F-7), GND: E101/DM-89(F-7)
Trigger: TP4/DM-89(E-1), GND: E702/DM-89(D-1)

(11) OXIDE Y adjustment

Playback the 75% color-bar signal portion (0:00 to 3:00) of the alignment tape CR5-2A or CR5-2A PS, and perform the adjustment.

(DNW-A100/A50/A45: CR5-2A, DNW-A100P/A50P/A45P: CR5-2A PS)

Note

Adjust respectively for Y-A and Y-B channels.

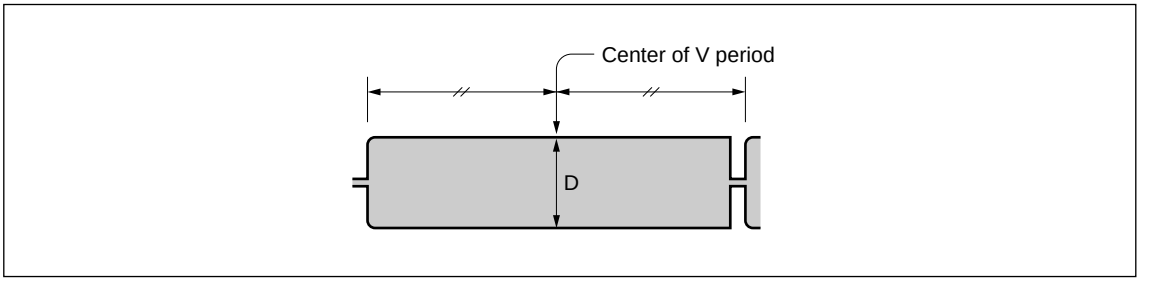
Observing the Y-A channel, set the trigger of oscilloscope to the negative (−) slope.

Observing the Y-B channel, set the trigger of oscilloscope to the positive (+) slope.

Adjustment points: Y-A channel: A30 : EQ VR : RF GAIN OXIDE-Y-A

Y-B channel: A30 : EQ VR : RF GAIN OXIDE-Y-B

Specifications (Y-A and Y-B channels): D = 250 ±20 mV p-p



(12) Eject the alignment tape CR5-2A/CR5-2A PS.

(13) To exit from A30 : EQ VR, press the MENU button once on the lower control panel.

(14) Saving data

Select A3F : NV-RAM CONTROL of the maintenance mode, then execute “SAVE ALL ADJUST DATA”.

(15) Check that the message “Save Complete” is displayed on the video monitor.

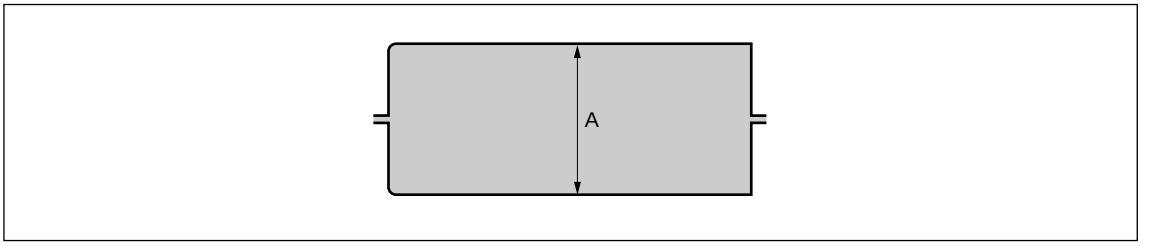
(16) To exit from A3F : NV-RAM CONTROL, press the MENU button once.

6-3-3. DM RF Output Level Pre-adjustment

Measuring equipment: Oscilloscope (Band width limit: ON)

(1) Connect and set the oscilloscope as follows:
CH-1: TP3/DM-89(E-1), AC 100 mV/DIV, 2 ms/DIV, GND: E702/DM-89(D-1)
CH-2: TP4/DM-89(E-1), DC 1 V/DIV, GND: E702/DM-89(D-1)
Trigger: CH-2, negative (−) slope

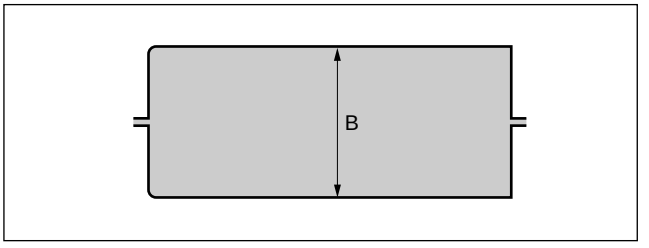
(2) METAL Y adjustment
Playback the flat field signal portion (24:00 to 26:00) of the alignment tape CR5-1B or CR5-1B PS, and perform the adjustment.
(DNW-A100/A50/A45: CR5-1B, DNW-A100P/A50P/A45P: CR5-1B PS)
Adjustment point: ⊘RV211/DM-89(G-6)
Specification: A = 400 ± 40 mV p-p



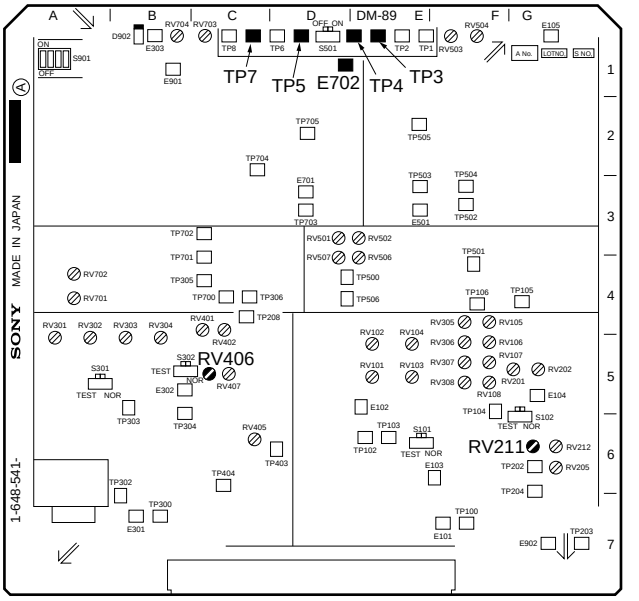
(3) Stop the playback of the alignment tape CR5-1B/CR5-1B PS.

(4) Change the connection of the oscilloscope as follows:
CH-1: TP7/DM-89(C-1), GND: E702/DM-89(D-1)
Trigger: TP5/DM-89(D-1), GND: E702/DM-89(D-1)

(5) METAL C adjustment
Playback the flat field signal portion (24:00 to 26:00) of the alignment tape CR5-1B or CR5-1B PS, and perform the adjustment.
(DNW-A100/A50/A45: CR5-1B, DNW-A100P/A50P/A45P: CR5-1B PS)
Adjustment point: ⊘RV406/DM-89(C-5)
Specification: B = 400 ± 40 mV p-p



(6) Eject the alignment tape CR5-1B/CR5-1B PS.



DM-89 Board (Side A)

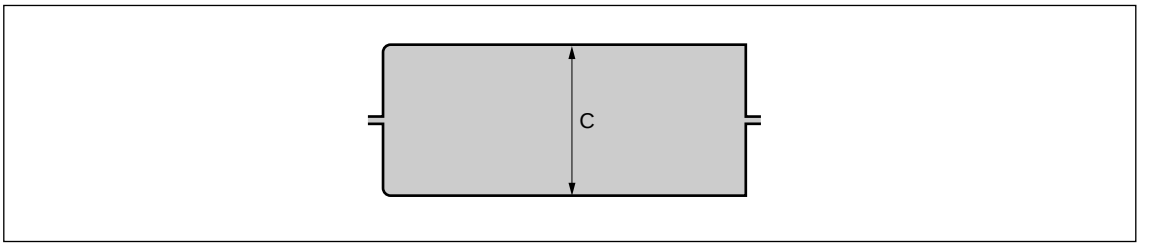
(7) OXIDE C adjustment

Playback the 75% color-bar signal portion (0:00 to 3:00) of the alignment tape CR5-2A or CR5-2A PS, and perform the adjustment.

(DNW-A100/A50/A45: CR5-2A, DNW-A100P/A50P/A45P: CR5-2A PS)

Adjustment point: ◓RV407/DM-89(C-5)

Specification: C = 400 ±40 mV p-p



(8) Stop the playback of the alignment tape CR5-2A/CR5-2A PS.

(9) Change the connection of the oscilloscope as follows:

CH-1: TP3/DM-89(E-1), GND: E702/DM-89(D-1)

Trigger: TP4/DM-89(E-1), GND: E702/DM-89(D-1)

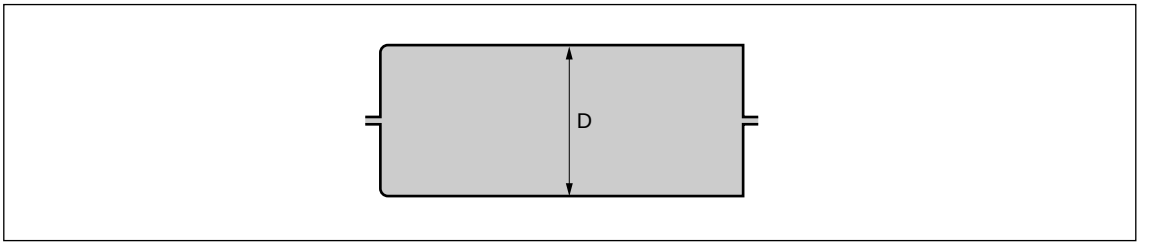
(10) OXIDE Y adjustment

Playback the 75% color-bar signal portion (0:00 to 3:00) of the alignment tape CR5-2A or CR5-2A PS, and perform the adjustment.

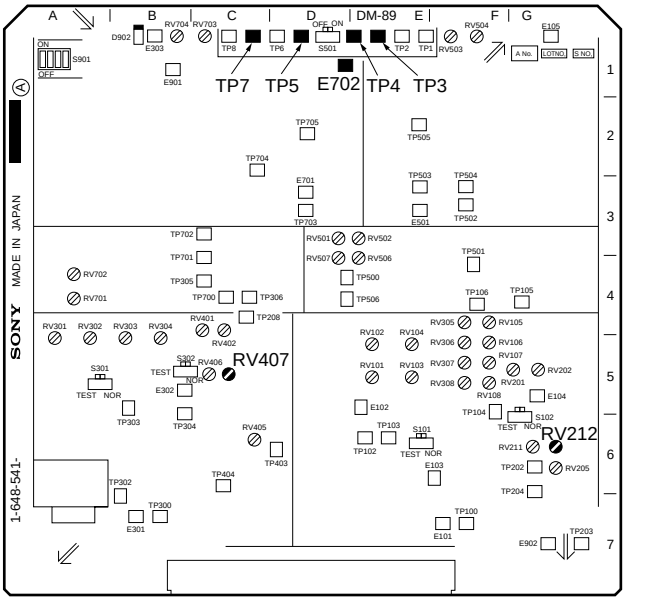
(DNW-A100/A50/A45: CR5-2A, DNW-A100P/A50P/A45P: CR5-2A PS)

Adjustment point: ◓RV212/DM-89(G-6)

Specification: D = 400 ±40 mV p-p



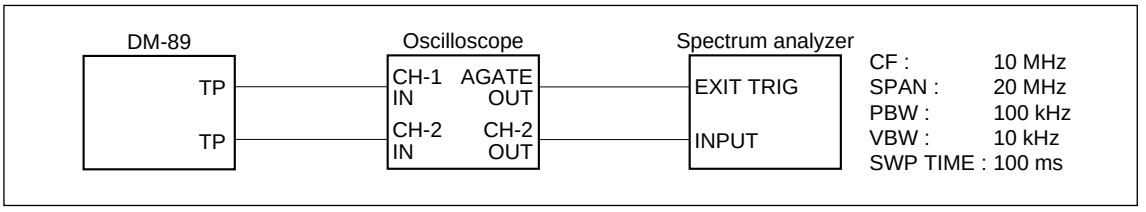
(11) Stop the playback of the alignment tape CR5-2A/ CR5-2A PS .



DM-89 Board (Side A)

6-3-4. OMC Carrier Balance Adjustment

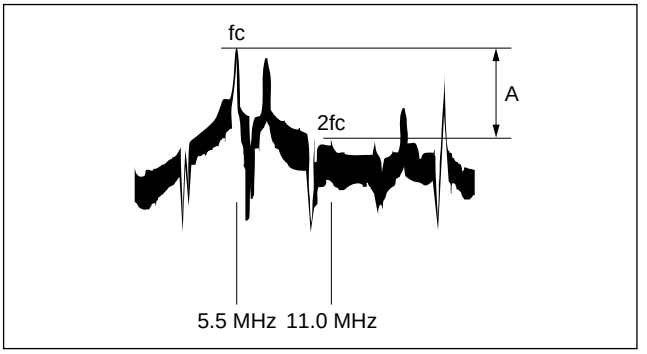
Measuring equipment: Spectrum analyzer and Oscilloscope (Show below for connection.)



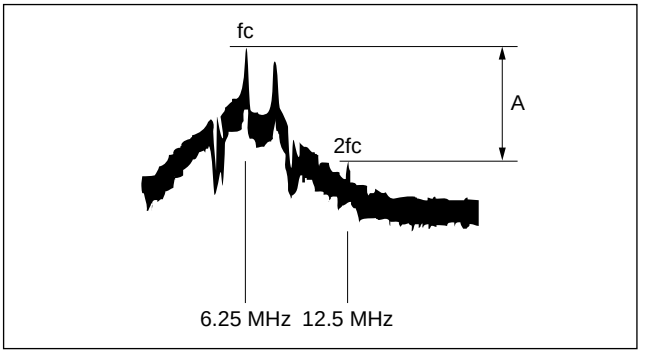
Connection and Setting of Spectrum Analyzer

(1) Connect and set the oscilloscope as follows:
CH-1: TP4/DM-89(E-1), DC 1 V/DIV, GND: E702/DM-89(D-1)
CH-2: TP105/DM-89(G-4), AC 1 V/DIV, 5 ms/DIV, GND: E105/DM-89(G-1)
Trigger: CH-1, negative (−) slope

(2) OXIDE Y adjustment
Playback the pulse & bar signal portion (9:00 to 11:00) of the alignment tape CR5-2A or CR5-2A PS, and perform the adjustment.
(DNW-A100/A50/A45: CR5-2A, DNW-A100P/A50P/A45P: CR5-2A PS)
Adjustment point: ⊘RV107/DM-89(F-5) and ⊘RV108/DM-89(F-5)
Specification: A ≧ 35 dB

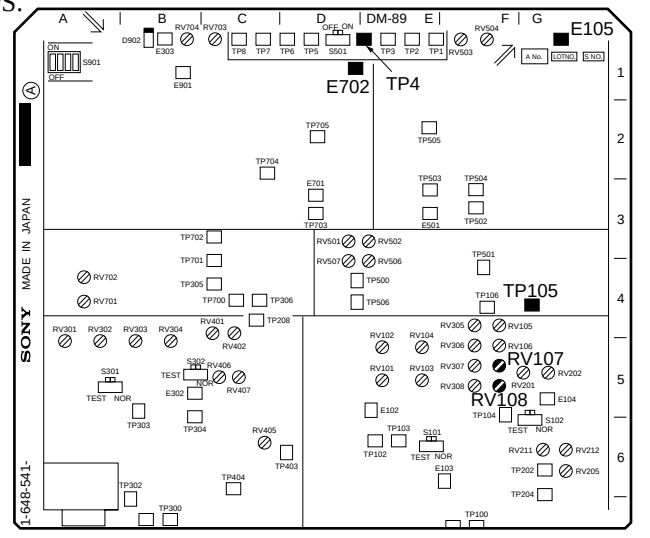


DNW-A100/A50/A45



DNW-A100P/A50P/A45P

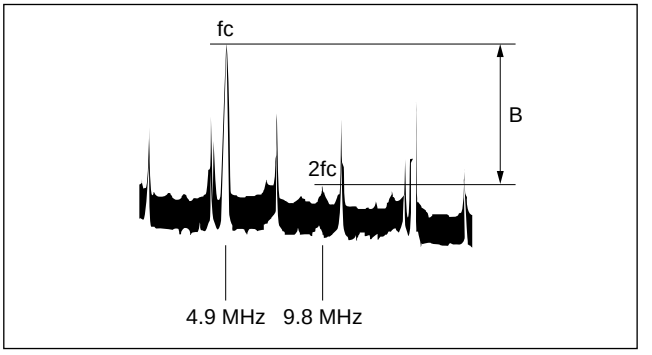
(3) Stop the playback of the alignment tape CR5-2A/CR5-2A PS.



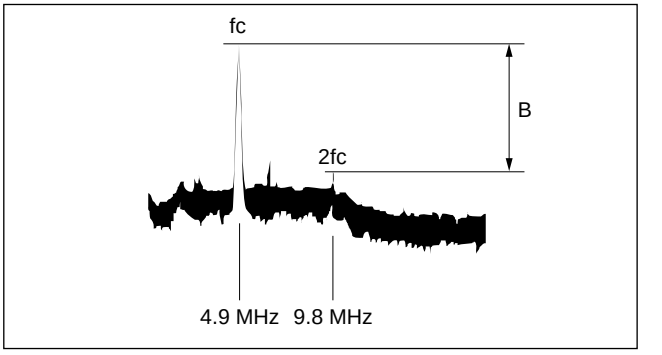
DM-89 Board (Side A)

(4) Change the connection of the oscilloscope as follows:
CH-1: TP5/DM-89(D-1), GND: E702/DM-89(D-1)
CH-2: TP305/DM-89(C-4), GND: E303/DM-89(B-1)

(5) OXIDE C adjustment
Playback the pulse & bar signal portion (9:00 to 11:00) of the alignment tape CR5-2A or CR5-2A PS, and perform the adjustment.
(DNW-A100/A50/A45: CR5-2A, DNW-A100P/A50P/A45P: CR5-2A PS)
Adjustment point: ⊘RV307/DM-89(F-5) and ⊘RV308/DM-89(F-5)
Specification: B ≧ 35 dB



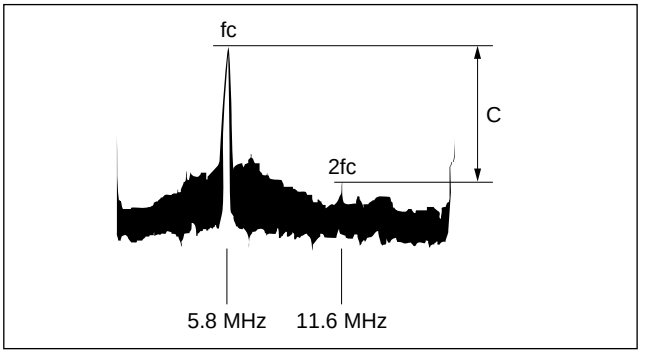
DNW-A100/A50/A45



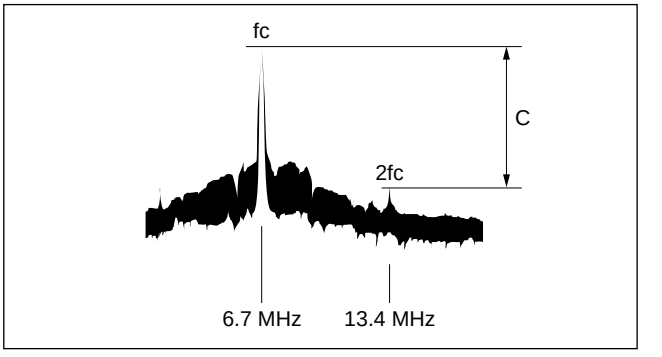
DNW-A100P/A50P/A45P

(6) Eject the alignment tape CR5-2A/CR5-2A PS.

(7) METAL C adjustment
Playback the flat field signal portion (24:00 to 26:00) of the alignment tape CR5-1B or CR5-1B PS, and perform the adjustment.
(DNW-A100/A50/A45: CR5-1B, DNW-A100P/A50P/A45P: CR5-1B PS)
Adjustment point: ⊘RV305/DM-89(F-4) and ⊘RV306/DM-89(F-5)
Specification: C ≧ 40 dB



DNW-A100/A50/A45



DNW-A100P/A50P/A45P

(8) Stop the playback of the alignment tape CR5-1B/CR5-1B PS.

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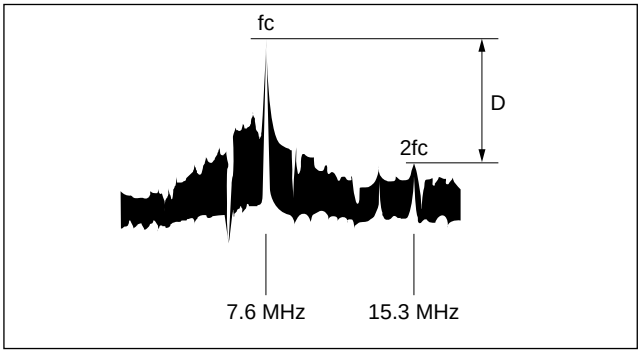
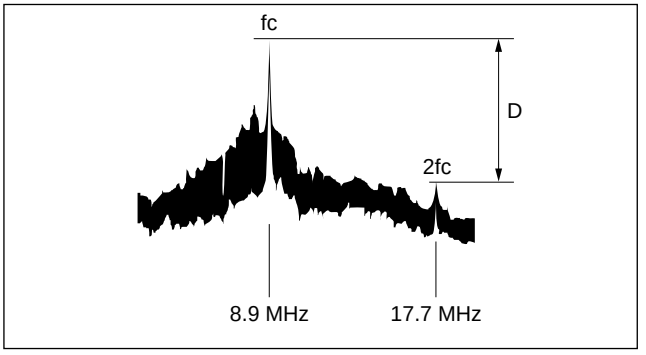
(9) Change the connection of the oscilloscope as follows:
CH-1: TP4/DM-89(E-1), GND: E702/DM-89(D-1)
CH-2: TP105/DM-89(G-4), GND: E105/DM-89(G-1)

(10) METAL Y adjustment
Playback the flat filed signal portion (24:00 to 26:00) of the alignment tape CR5-1B or CR5-1B PS, and perform the adjustment.
(DNW-A100/A50/A45: CR5-1B, DNW-A100P/A50P/A45P: CR5-1B PS)
Adjustment points: ⊘RV105/DM-89(F-4) and ⊘RV106/DM-89(F-5)
Specification: D ≧ 40 dB

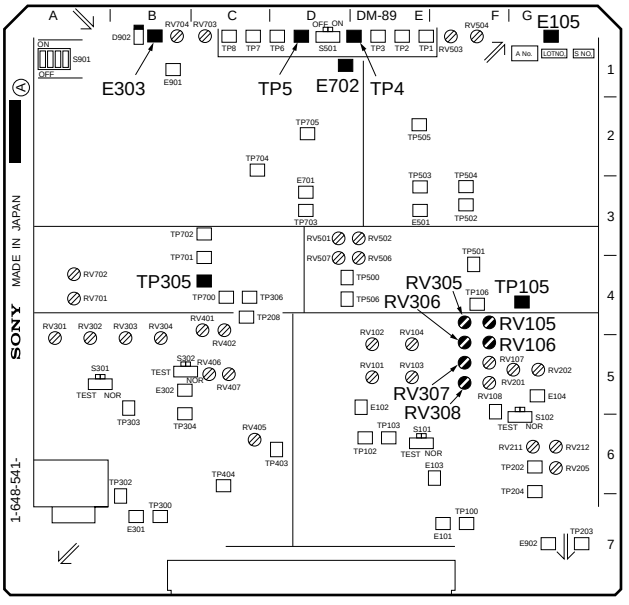


DNW-A100/A50/A45



DNW-A100P/A50P/A45P

(11) Stop the playback of the alignment tape CR5-1B/CR5-1B PS .



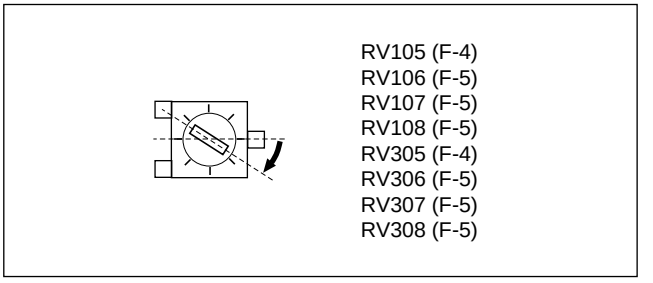
DM-89 Board (Side A)

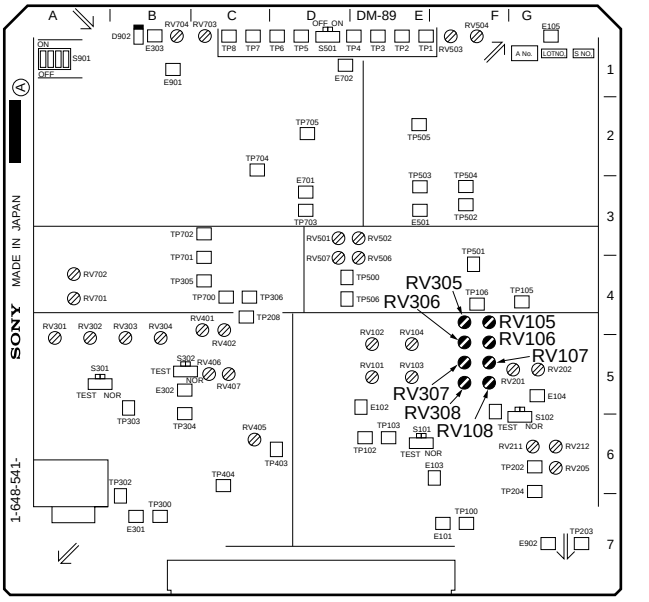
6-3-5. OMC Carrier Balance Adjustment (Provisional)

Notes

- This section explains a provisional adjustment for OMC carrier balance without using a spectrum analyzer. If Section 6-3-4. “OMC Carrier Balance Adjustment” is completed, this adjustment is not required.
- Perform this provisional adjustment only when the spectrum analyzer is not available for an urgent maintenance. At a later date, be sure to readjust using the spectrum analyzer referring to Section 6-3-4.

Set the following RVs on DM-89 board to specified position respectively.

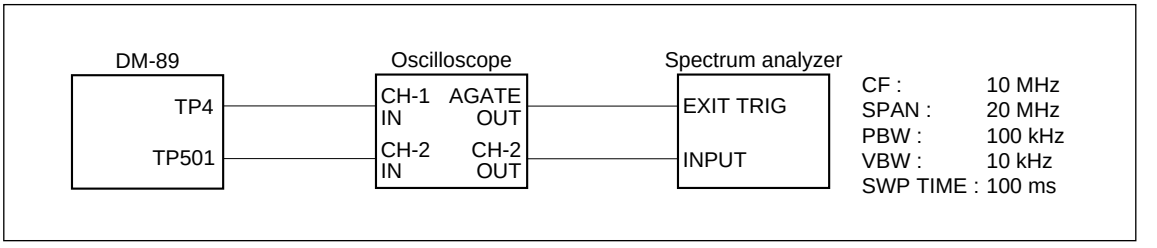




DM-89 Board (Side A)

6-3-6. Demodulator Limiter Balance Adjustment

Measuring equipment: Spectrum analyzer and Oscilloscope (Show below for connection.)



Connection and Setting of Spectrum Analyzer

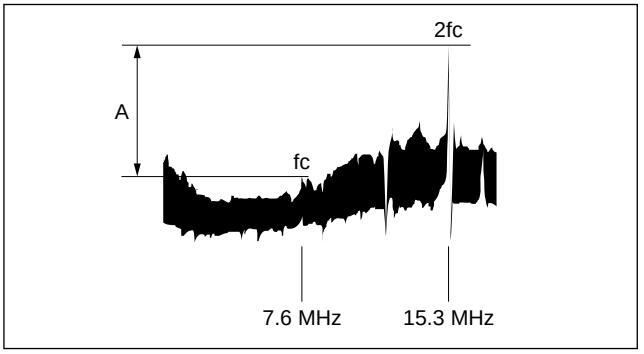
Note

In the Y adjustment, perform the provisional adjustment described below only when the spectrum analyzer is not available for an urgent maintenance. If the provisional adjustment is performed, be sure to readjust the Y signal using the spectrum analyzer at a later date.

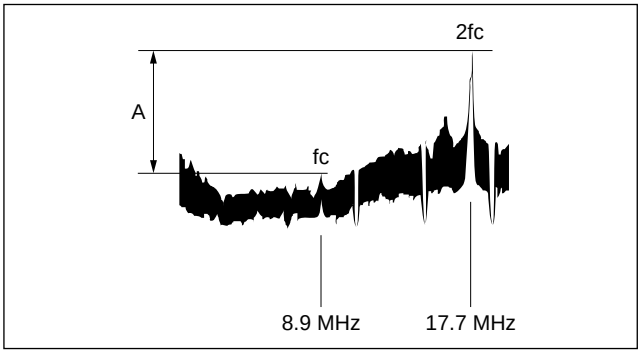
Y adjustment (using the spectrum analyzer)

(1) Connect and set the oscilloscope as follows:
CH-1: TP4/DM-89(E-1), DC 1 V/DIV, GND: E702/DM-89(D-1)
CH-2: TP501/DM-89(F-4), AC 1 V/DIV, 5 ms/DIV, GND: E501/DM-89(E-3)
Trigger: CH-1, negative (−) slope

(2) Playback the flat filed signal portion (24:00 to 26:00) of the alignment tape CR5-1B or CR5-1B PS, and perform the adjustment.
(DNW-A100/A50/A45: CR5-1B, DNW-A100P/A50P/A45P: CR5-1B PS)
Adjustment point: ⊘RV502/DM-89(E-3)
Specification: Maximize the level difference A. (Minimize the fc.)



DNW-A100/A50/A45



DNW-A100P/A50P/A45P

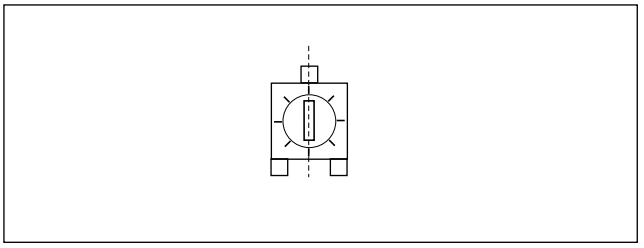
(3) Stop the playback of the alignment tape CR5-1B/CR5-1B PS.

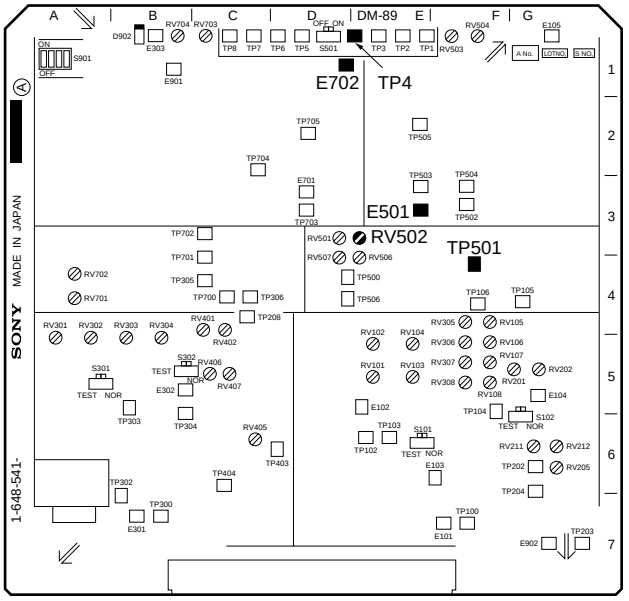
Provisional Y adjustment (without using the spectrum analyzer)

Note

This section explains the provisional adjustment for Y signal without using a spectrum analyzer. If the above-mentioned Y adjustment is completed, this adjustment is not required.

Set RV502/DM-89 (E-3) as shows below.



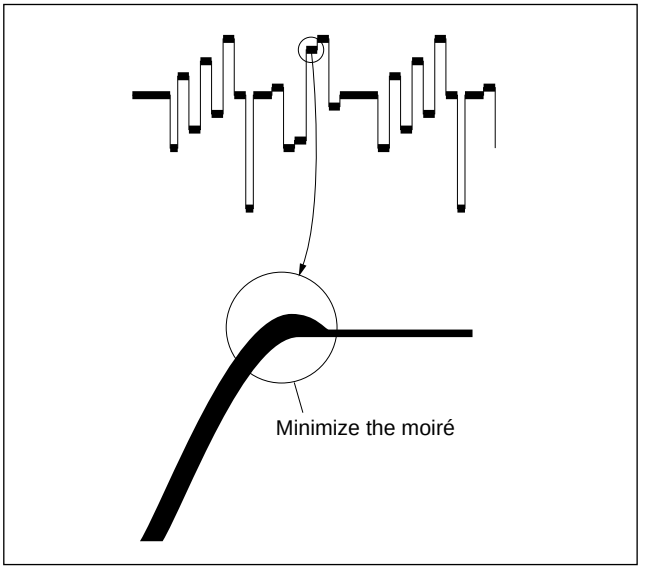


DM-89 Board (Side A)

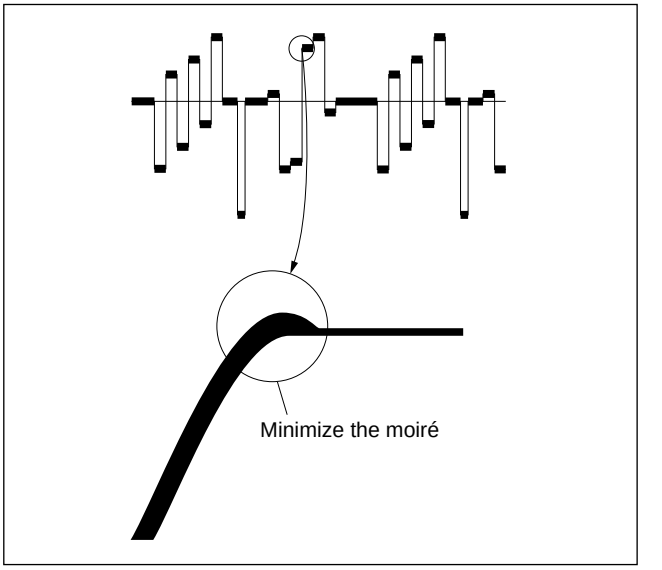
C adjustment

(4) Connect and set the oscilloscope as follows:
CH-2: TP8/DM-89(C-1), AC 200 mV/DIV, 10 µs/DIV, GND: E702/DM-89(D-1)
Trigger: CH-2

(5) Playback the color-bar signal portion (14:00 to 17:00) of the alignment tape CR5-1B or CR5-1B PS, and perform the adjustment.
(DNW-A100/A50/A45: CR5-1B, DNW-A100P/A50P/A45P: CR5-1B PS)
Adjustment point: ⊘RV702/DM-89(A-4)
Specification: Minimize the moiré of specified part.

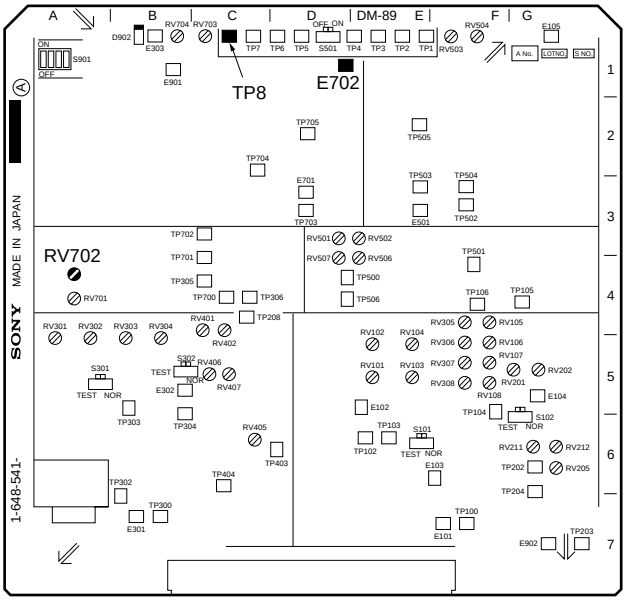


DNW-A100/A50/A45



DNW-A100P/A50P/A45P

(6) Stop the playback of the alignment tape CR5-1B/CR5-1B PS.



DM-89 Board (Side A)

6-3-7. PB Frequency Response Adjustment

Measuring equipment: Component waveform monitor (terminated with 75 Ω)

(1) Select A32 : DM VR 1 of the maintenance mode.
(2) Observe the Y output signal on the component waveform monitor.

METAL Y adjustment [up to step (6)]

(3) Playback the multiburst signal portion (8:00 to 11:00) of the alignment tape CR5-1B or CR5-1B PS, and adjust so that the level at 4.1 MHz (or 5 MHz for PAL) portion is within specification. And confirm that levels at other frequencies are within specifications.
(DNW-A100/A50/A45: CR5-1B, DNW-A100P/A50P/A45P: CR5-1B PS)

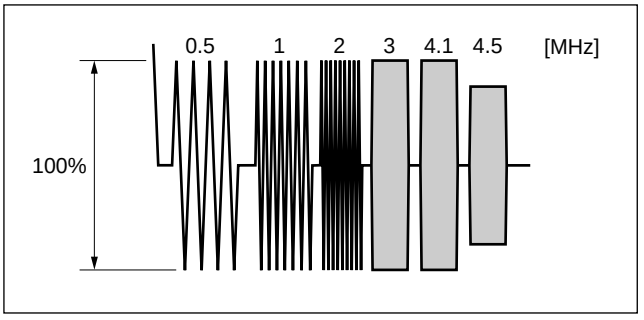
Note

The overlapping waveform of A channel and B channel signals is monitored on the component waveform monitor. So adjust/confirm the signal level at each channel.

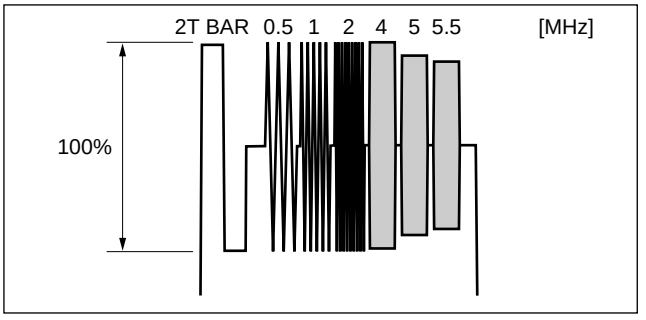
Adjustment points: A channel: A32 : DM VR 1 : EQ1 METAL-Y-A
B channel: A32 : DM VR 1 : EQ1 METAL-Y-B
Specifications (A and B channels): Show the table below.

Frequency	Specifications for DNW-A100/A50/A45	
0.5 MHz	Reference: 100% {0 dB}	
4.1 MHz	Adjust : 94 (100 to 90)%	{−0.5 $^{+0.5}_{-0.4}$ dB}
1 MHz	Check : 100 (106 to 63)%	{0 $^{+0.5}_{-4.0}$ dB}
2 MHz	Check : 100 (106 to 63)%	{0 $^{+0.5}_{-4.0}$ dB}
3 MHz	Check : 100 (106 to 63)%	{0 $^{+0.5}_{-4.0}$ dB}
4.5 MHz	Check : 80 (106 to 63)%	{−2.0 $^{+2.5}_{-2.0}$ dB}

Frequency	Specifications for DNW-A100P/A50P/A45P	
2T BAR	Reference: 100% {0 dB}	
5 MHz	Check : 100 (96 to 87)%	{−0.8 ± 0.4 dB}
0.5 MHz	Check : 100 (106 to 63)%	{0 $^{+0.5}_{-4.0}$ dB}
1 MHz	Check : 100(106 to 63)%	{0 $^{+0.5}_{-4.0}$ dB}
2 MHz	Check : 100 (106 to 63)%	{0 $^{+0.5}_{-4.0}$ dB}
4 MHz	Check : 100 (106 to 63)%	{0 $^{+0.5}_{-4.0}$ dB}
5.5 MHz	Check : 84 (106 to 63)%	{−1.5 $^{+2.0}_{-2.5}$ dB}



DNW-A100/A50/A45



DNW-A100P/A50P/A45P

(4) Connect the video monitor to VIDEO OUTPUT COMPOSITE 2 connector.
(5) Playback the multiburst signal portion (8:00 to 11:00) of the alignment tape CR5-1B or CR5-1B PS, and check that the playback picture on the video monitor has no flicker.
(DNW-A100/A50/A45: CR5-1B, DNW-A100P/A50P/A45P: CR5-1B PS)
(6) Reconnect the video monitor to VIDEO OUTPUT COMPOSITE 3 connector.

METAL C adjustment [up to step (9)]

(7) Observe the R-Y output signal on the component waveform monitor.

(8) Playback the multiburst signal portion (8:00 to 11:00) of the alignment tape CR5-1B or CR5-1B PS, and adjust so that the level at 1 MHz (or 1.5 MHz for PAL) portion is within specification. And confirm that levels at other frequencies are within specifications.
(DNW-A100/A50/A45: CR5-1B, DNW-A100P/A50P/A45P: CR5-1B PS)

Note

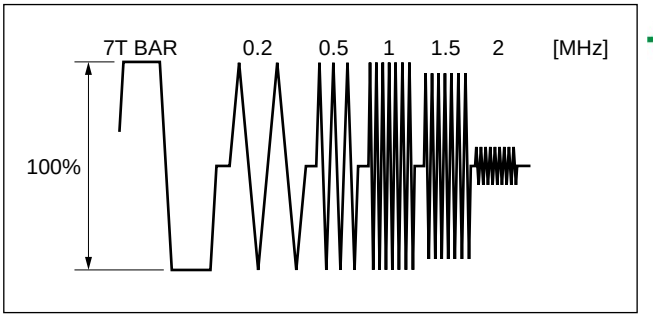
The overlapping waveform of A channel and B channel signals is monitored on the component waveform monitor. So adjust/confirm the signal level at each channel.

Adjustment points: A channel: A32 : DM VR 1 : EQ1 METAL-C-A
B channel: A32 : DM VR 1 : EQ1 METAL-C-B

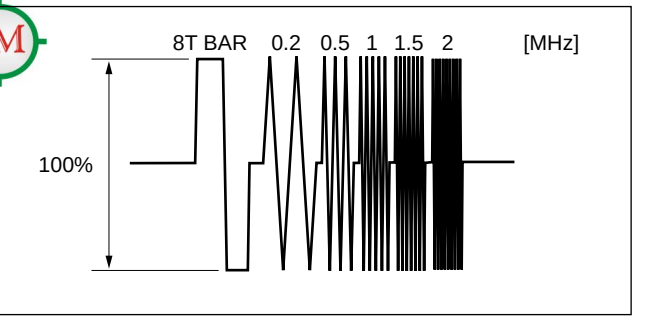
Specifications (A and B channels): Show the table below.

Frequency	Specification for DNW-A100/A50/A45	
7T BAR	Reference: 100% {0 dB}	
1 MHz	Adjust : 94 (100 to 89)%	{−0.5 ±0.5 dB}
0.2 MHz	Check : 100 (106 to 71)%	{0 $^{+0.5}_{-3.0}$ dB}
0.5 MHz	Check : 100 (106 to 71)%	{0 $^{+0.5}_{-3.0}$ dB}
2 MHz	Check : 80 (106 to 71)%	{−2.0 $^{+2.5}_{-1.0}$ dB}

Frequency	Specifications for DNW-A100P/A50P/A45P	
8T BAR	Reference: 100% {0 dB}	
1.5 MHz	Adjust : 93 (102 to 85)%	{−0.6 ±0.8 dB}
0.2 MHz	Check : 100 (106 to 71)%	{0 $^{+0.5}_{-3.0}$ dB}
0.5 MHz	Check : 100 (106 to 71)%	{0 $^{+0.5}_{-3.0}$ dB}
1 MHz	Check : 100 (106 to 71)%	{0 $^{+0.5}_{-3.0}$ dB}
2 MHz	Check : 80 (106 to 71)%	{−2.0 $^{+2.5}_{-1.0}$ dB}



DNW-A100/A50/A45



DNW-A100P/A50P/A45P

(9) Observe the B-Y output signal on the component waveform monitor. Confirm the B-Y signal levels at each frequencies are within specifications shown above. If the B-Y signal is out of specifications, perform fine adjustment for R-Y until the specifications for both B-Y and R-Y signals are satisfied.

(10) Eject the alignment tape CR5-1B/CR5-1B PS.

OXIDE Y adjustment [up to step (13)]

(11) Observe the Y output signal on the component waveform monitor.

(12) Playback the multiburst signal portion (3:00 to 6:00) of the alignment tape CR5-2A or CR5-2A PS, and adjust so that the level at 2 MHz (or 3 MHz for PAL) portion is within specification. And confirm that levels at other frequencies are within specifications.
(DNW-A100/A50/A45: CR5-2A, DNW-A100P/A50P/A45P: CR5-2A PS)

Note

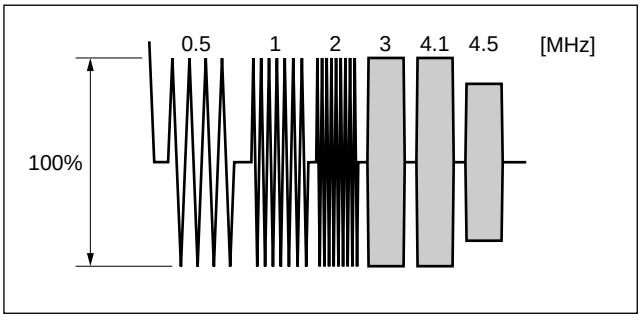
The overlapping waveform of A channel and B channel signals is monitored on the component waveform monitor. So adjust/confirm the signal level at each channel.

Adjustment points: A channel: A32 : DM VR 1 : EQ1 OXIDE-Y-A
B channel: A32 : DM VR 1 : EQ1 OXIDE-Y-B

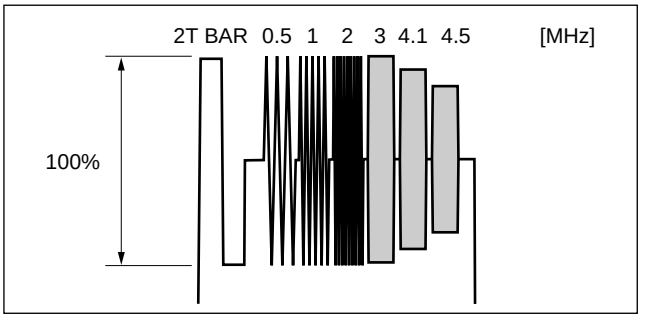
Specifications (A and B channels): Show the table below.

Frequency	Specifications for DNW-A100/A50/A45	
0.5 MHz	Reference: 100% {0 dB}	
2 MHz	Adjust : 100 (104 to 95)%	{0 $^{+0.3}_{-0.4}$ dB}
1 MHz	Check : 100 (106 to 50)%	{0 $^{+0.5}_{-6.0}$ dB}
3 MHz	Check : 89 (106 to 50)%	{−1.0 $^{+1.5}_{-5.0}$ dB}
4.1 MHz	Check : 71 (106 to 50)%	{−3.0 $^{+3.5}_{-3.0}$ dB}

Frequency	Specifications for DNW-A100P/A50P/A45P	
2T BAR	Reference: 100% {0 dB}	
3 MHz	Adjust : 89 (100 to 79)%	{−1.0 ±1.0 dB}
0.5 MHz	Check : 100 (106 to 50)%	{0 $^{+0.5}_{-6.0}$ dB}
1 MHz	Check : 100 (106 to 50)%	{0 $^{+0.5}_{-6.0}$ dB}
2 MHz	Check : 100 (106 to 50)%	{0 $^{+0.5}_{-6.0}$ dB}
4.1 MHz	Check : 71 (106 to 50)%	{−3.0 $^{+3.5}_{-3.0}$ dB}



DNW-A100/A50/A45



DNW-A100P/A50P/A45P

(13) Playback the multiburst signal portion (3:00 to 6:00) of the alignment tape CR5-2A or CR5-2A PS, and confirm that the level difference between the A and B channel signals is hardly noticeable at high frequency portion (4.5 MHz).

Note

If the level difference is noticeable at 4.5 MHz, adjustment using menu A34: DM VR3: SUB OXIDE-A or -B is required. Following steps ① to ⑤, adjust the channel with the lower level while playing back the multiburst signal portion (3:00 to 6:00) of the alignment tape.

① To exit from A32 : DM VR 1, press the MENU button once.
② Select A34 : DM VR 3 of the maintenance mode.
③ Change the data value of SUB OXIDE-Y-A (A channel side), and judge which signal is low in level.
④ If the B channel signal is low, return the data value of SUB OXIDE-Y-A to the former data value, then adjust the SUB OXIDE-Y-B to increase the value until the level of B channel signal is almost equal to the level of A channel signal.
If the A channel signal is low, adjust the SUB OXIDE-Y-A to increase the value until the level of A channel signal is almost equal to level of B channel signal.
⑤ To exit from A34 : DM VR 3, press the MENU button once.

OXIDE C adjustment [up to step (16)]

(14) Observe the R-Y output signal on the component waveform monitor.

(15) Playback the multiburst signal portion (3:00 to 6:00) of the alignment tape CR5-2A or CR5-2A PS, and adjust so that the level at 1 MHz portion is within specification. And confirm that levels at other frequencies are within specifications.
(DNW-A100/A50/A45: CR5-2A, DNW-A100P/A50P/A45P: CR5-2A PS)

Note

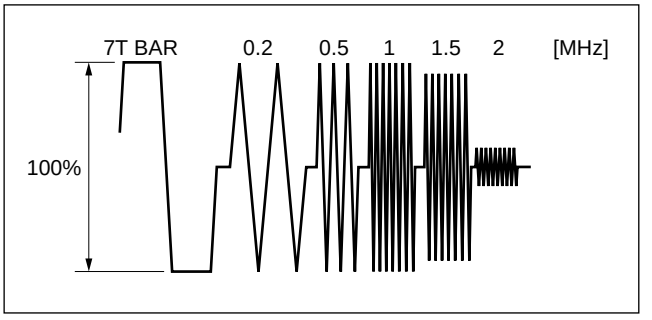
The overlapping waveform of A channel and B channel signals is monitored on the component waveform monitor. So adjust/confirm the signal level at each channel.

Adjustment points: A channel: A32 : DM VR 1 : EQ1 OXIDE-C-A
B channel: A32 : DM VR 1 : EQ1 OXIDE-C-B

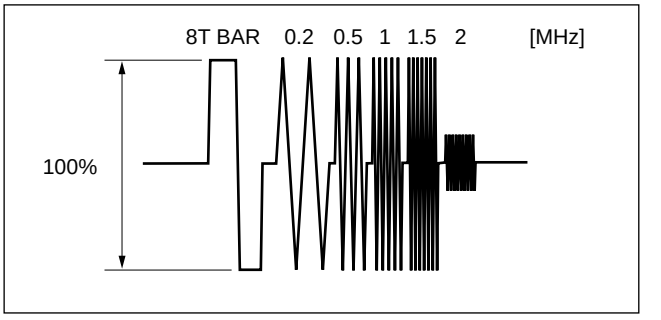
Specifications (A and B channels): Show the table below.

Frequency	Specification for DNW-A100/A50/A45	
7T BAR	Reference: 100% {0 dB}	
1 MHz	Adjust : 94 (100 to 89)%	{−0.5 ±0.5 dB}
0.2 MHz	Check : 100 (106 to 71)%	{0 $^{+0.5}_{-3.0}$ dB}
0.5 MHz	Check : 95 (106 to 71)%	{−0.4 $^{+0.9}_{-2.6}$ dB}
1.5 MHz	Check : 80 (106 to 71)%	{−2.0 $^{+2.5}_{-1.0}$ dB}

Frequency	Specifications for DNW-A100P/A50P/A45P	
8T BAR	Reference: 100% {0 dB}	
1 MHz	Adjust : 94 (102 to 86)%	{−0.5 ±0.8 dB}
0.2 MHz	Check : 100 (106 to 71)%	{0 $^{+0.5}_{-3.0}$ dB}
0.5 MHz	Check : 100 (106 to 71)%	{0 $^{+0.5}_{-3.0}$ dB}
1.5 MHz	Check : 84 (106 to 71)%	{−1.5 $^{+2.0}_{-1.5}$ dB}



DNW-A100/A50/A45



DNW-A100P/A50P/A45P

(16) Observe the B-Y output signal on the component waveform monitor. Confirm the B-Y signal levels at each frequencies are within specifications shown above. If the B-Y signal is out of specifications, perform fine adjustment for R-Y until the specifications for both B-Y and R-Y signals are satisfied.

(17) Eject the alignment tape CR5-2A/CR5-2A PS.

(18) To exit from A32 : DM VR 1, press the MENU button once.

Saving data [up to step (21)]

(19) Select A3F : NV-RAM CONTROL of the maintenance mode, and execute “SAVE ALL ADJUST DATA”.

(20) Check that the message “Save Complete” is displayed on the video monitor.

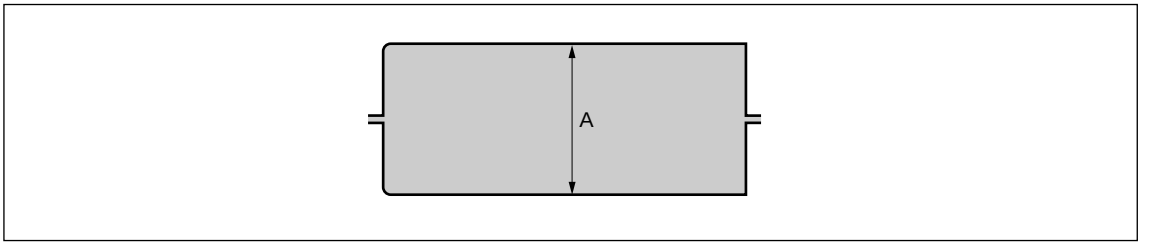
(21) To exit from A3F : NV-RAM CONTROL, press the MENU button once.

6-3-8. DM RF Output Level Adjustment

Measuring equipment: Oscilloscope (Band width limit: ON)

(1) Connect and set the oscilloscope as follows:
CH-1: TP3/DM-89(E-1), AC 100 mV/DIV, 2 ms/DIV, GND: E702/DM-89(D-1)
CH-2: TP4/DM-89(E-1), DC 1 V/DIV, GND: E702/DM-89(D-1)
Trigger: CH-2, negative (−) slope

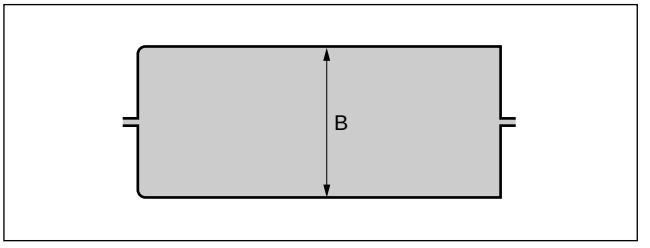
(2) METAL Y adjustment
Playback the flat field signal portion (24:00 to 26:00) of the alignment tape CR5-1B or CR5-1B PS, and perform the adjustment.
(DNW-A100/A50/A45: CR5-1B, DNW-A100P/A50P/A45P: CR5-1B PS)
Adjustment point: ⊘RV211/DM-89(G-6)
Specification: A = 400 ± 40 mV p-p



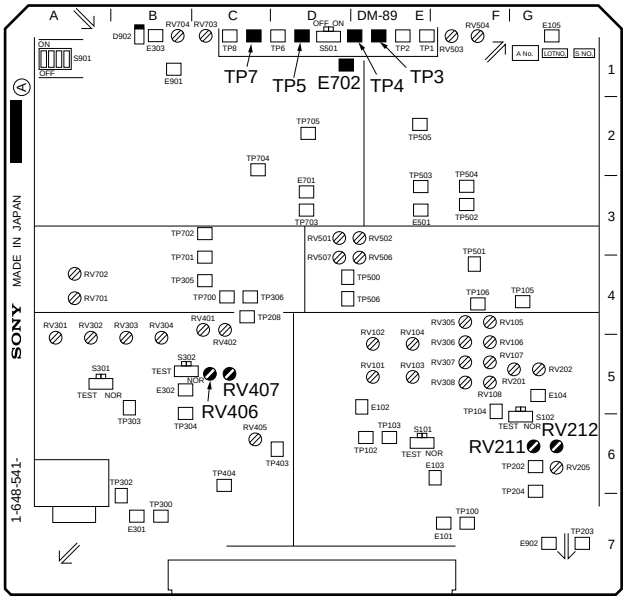
(3) Stop the playback of the alignment tape CR5-1B/CR5-1B PS.

(4) Change the connection of the oscilloscope as follows:
CH-1: TP7/DM-89(C-1), GND: E702/DM-89(D-1)
CH-2: TP5/DM-89(D-1), GND: E702/DM-89(D-1)

(5) METAL C adjustment
Playback the flat filed signal portion (24:00 to 26:00) of the alignment tape CR5-1B or CR5-1B PS, and perform the adjustment.
(DNW-A100/A50/A45: CR5-1B, DNW-A100P/A50P/A45P: CR5-1B PS)
Adjustment point: ⊘RV406/DM-89(C-5)
Specification: B = 400 ± 40 mV p-p

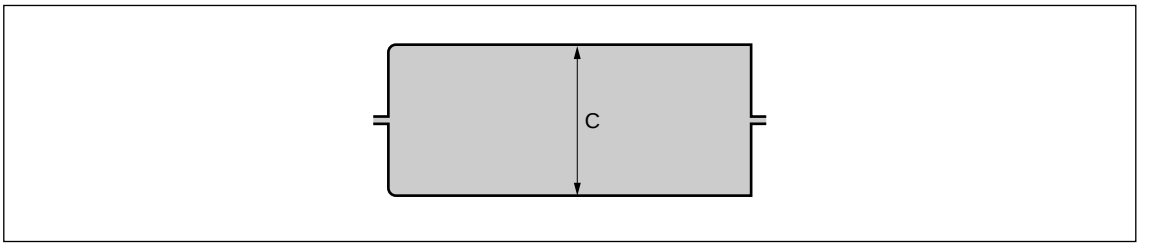


(6) Eject the alignment tape CR5-1B/CR5-1B PS.



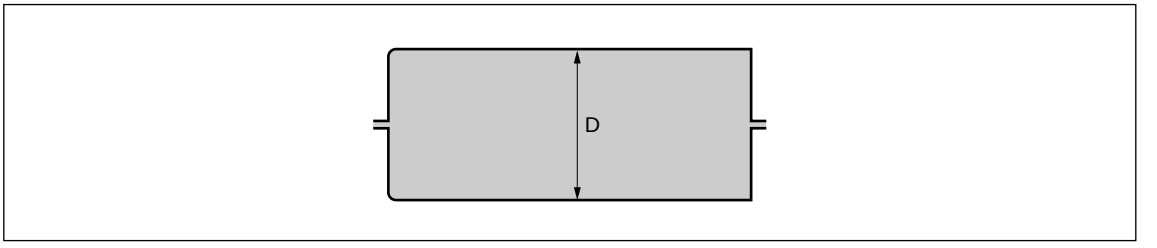
DM-89 Board (Side A)

(7) OXIDE C adjustment
Playback the 75% color-bar signal portion (0:00 to 3:00) of the alignment tape CR5-2A or CR5-2A PS, and perform the adjustment.
(DNW-A100/A50/A45: CR5-2A, DNW-A100P/A50P/A45P: CR5-2A PS)
Adjustment point: ⊘RV407/DM-89(C-5)
Specification: C = 400 ±40 mV p-p

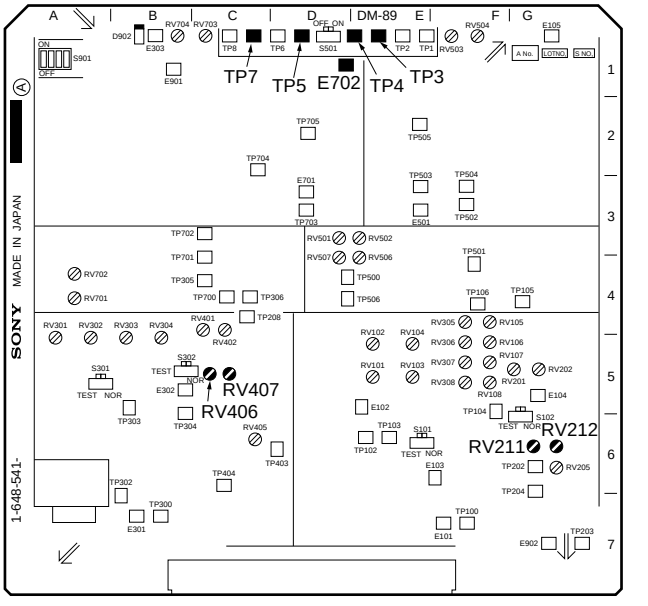


(8) Change the connection of the oscilloscope as follows:
CH-1: TP3/DM-89(E-1), GND: E702/DM-89(D-1)
CH-2: TP4/DM-89(E-1), GND: E702/DM-89(D-1)

(9) OXIDE Y adjustment
Playback the 75% color-bar signal portion (0:00 to 3:00) of the alignment tape CR5-2A or CR5-2A PS, and perform the adjustment.
(DNW-A100/A50/A45: CR5-2A, DNW-A100P/A50P/A45P: CR5-2A PS)
Adjustment point: ⊘RV212/DM-89(G-6)
Specification: D = 400 ±40 mV p-p



(10) Eject the alignment tape CR5-2A/CR5-2A PS.



DM-89 Board (Side A)

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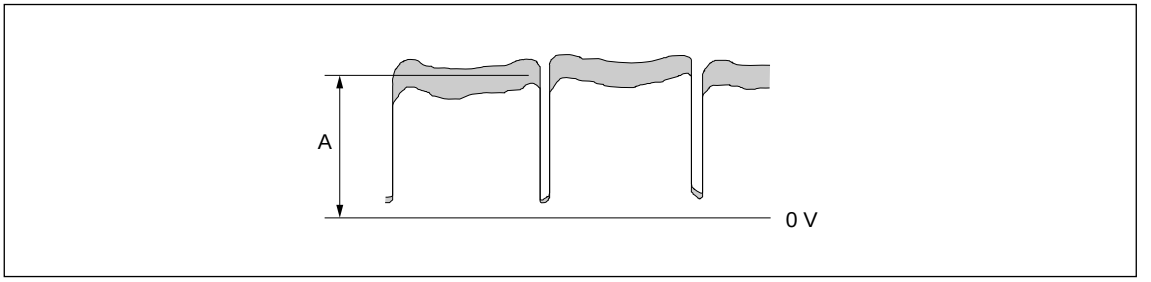
6-3-9. RF Envelope Adjustment

Measuring equipment: Oscilloscope

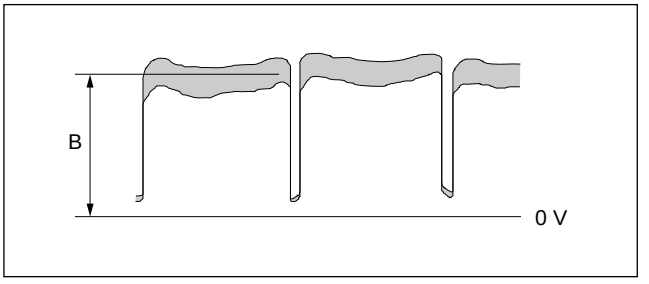
(1) Connect and set the oscilloscope as follows:
CH-1: TP203/DM-89(G-7), DC 500 mV/DIV, 5 ms/DIV, GND: E902/DM-89(G-7)
CH-2: TP4/DM-89(E-1), DC 1 V/DIV, GND: E702/DM-89(D-1)
Trigger: CH-2, negative (−) slope

(2) Y adjustment
Playback the flat filed signal portion (24:00 to 26:00) of the alignment tape CR5-1B or CR5-1B PS, and perform the adjustment.
(DNW-A100/A50/A45: CR5-1B, DNW-A100P/A50P/A45P: CR5-1B PS)
Adjustment point: ⊘RV205/DM-89(G-6)
Specification: A = 2.0 ± 0.2 V dc

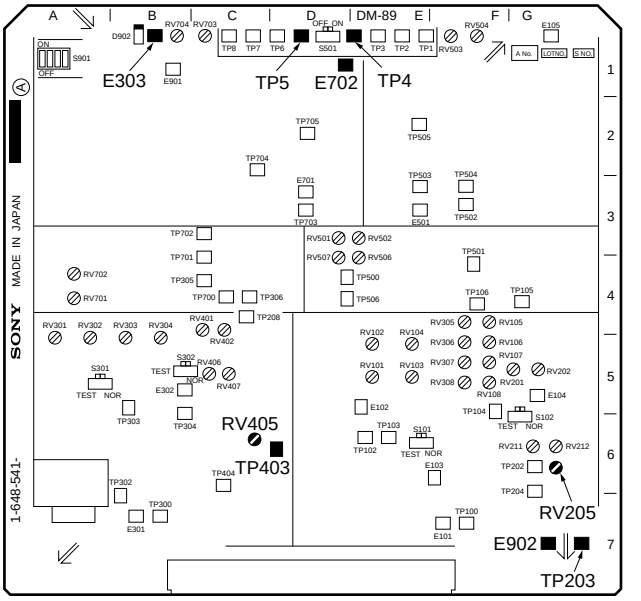


(3) Change the connection of the oscilloscope as follows:
CH-1: TP403/DM-89(D-6), GND: E303/DM-89(B-1)
CH-2: TP5/DM-89(D-1), GND: E702/DM-89(D-1)

(4) C adjustment
Playback the flat filed signal portion (24:00 to 26:00) of the alignment tape CR5-1B or CR5-1B PS, and perform the adjustment.
(DNW-A100/A50/A45: CR5-1B, DNW-A100P/A50P/A45P: CR5-1B PS)
Adjustment point: ⊘RV405/DM-89(C-6)
Specification: B = 2.0 ± 0.2 V dc



(5) Eject the alignment tape CR5-1B/CR5-1B PS.
(6) Turn off the power and allow 30 seconds to remove the extension board.
(7) Insert the DM-89 board in the slot.

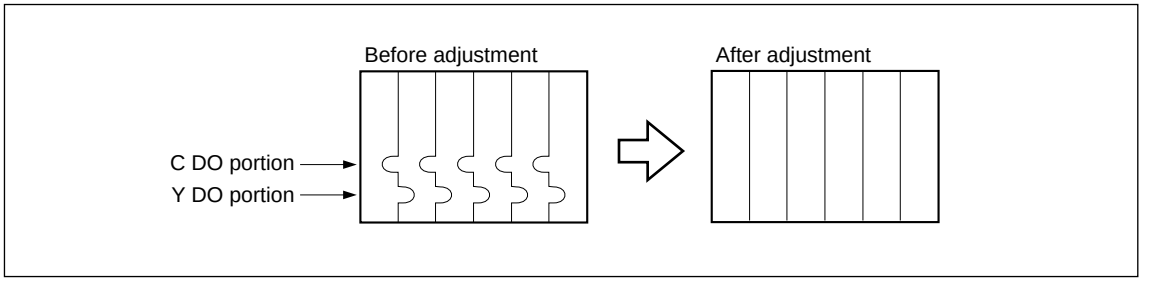


DM-89 Board (Side A)

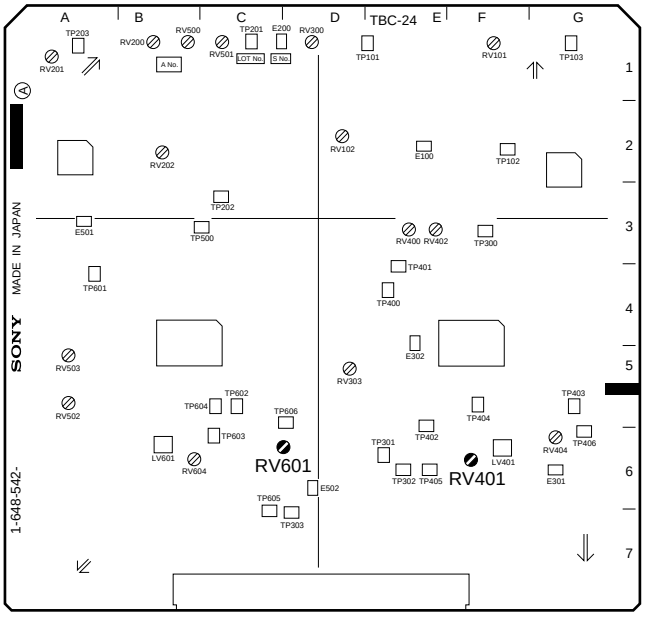
6-3-10. Impact Error Offset Adjustment

Measuring equipment: Video monitor

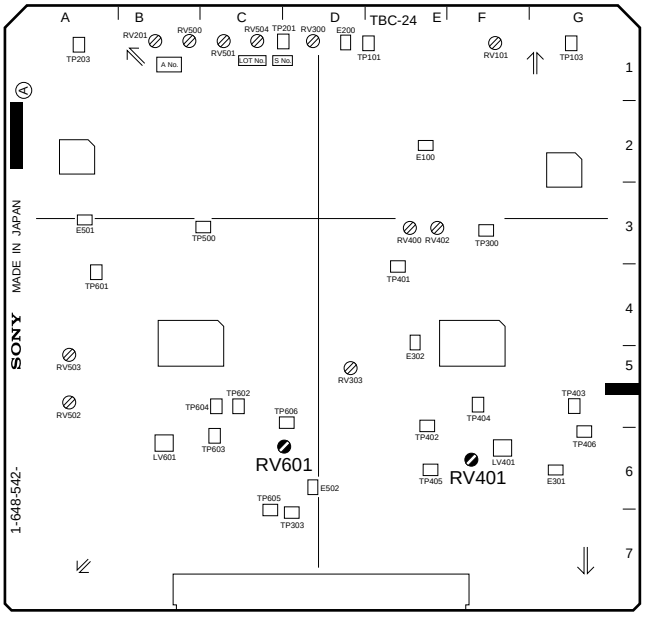
(1) Disconnect the harness connecting between TBC-23 and TBC-24 boards.
(2) Extend the TBC-24 board with an extension board EX-377.
(3) Connect the extension harness (14P) to CN1 on TBC-24 board and CN1 on TBC-23 board.
(4) Playback the color-bar signal portion (26:00 to 28:00) of the alignment tape CR5-1B or CR5-1B PS.
(DNW-A100/A50/A45: CR5-1B, DNW-A100P/A50P/A45P: CR5-1B PS)
(5) Adjust the following RVs until the drop-out portions (Y DO and C DO) of color-bars displayed on the video monitor disappear.
Adjustment points: Y DO: ⊘RV401/TBC-24(F-6)
C DO: ⊘RV601/TBC-24(D-6)
Specification: See the figure below.



(6) Eject the alignment tape CR5-1B/CR5-1B PS.
(7) Turn off the power and allow 30 seconds to remove the extension board and extension harness (14P).
(8) Insert the TBC-24 board in the slot.
(9) Reconnect the harness that was removed in step (1).



TBC-24 Board (Side A) (Suffix-11 and -12)



TBC-24 Board (Side A) (Suffix-13 and higher)

6-3-11. TBC Y/C Delay Adjustment

Note

Perform this adjustment without extending the TBC-24 board.

Measuring equipment: Component waveform monitor

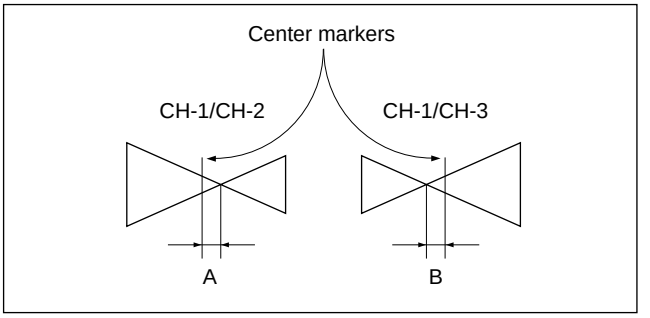
(1) Turn on the power.
(2) Set the component waveform monitor to BOWTIE mode.

METAL adjustment [up to step (4)]

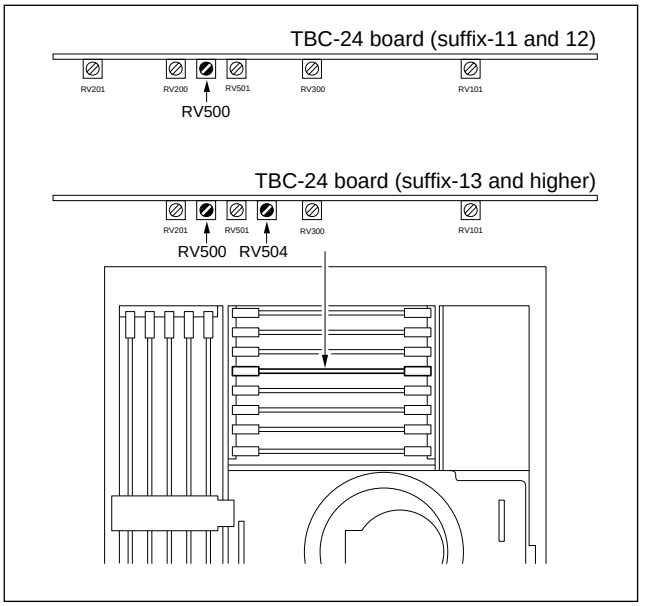
(3) Playback the bowtie signal portion (17:00 to 19:00) of the alignment tape CR5-1B or CR5-1B PS. (DNW-A100/A50/A45: CR5-1B, DNW-A100P/A50P/A45P: CR5-1B PS)
(4) Observe the bowtie dip point at which the CH-1 (Y) and CH-2 (B-Y) signals cross. Adjust so that the deviation between the center marker and bowtie dip point is within specification. Then observe the point at which the CH-1 (Y) and CH-3 (R-Y) signals cross and adjust in the same manner.
Adjustment points: Field 1: ⊘RV500/TBC-24(B-1)
Field 2: ⊘RV504/TBC-24(C-1)
Specifications: A = 0 ±10 ns
B = 0 ±10 ns

Note

RV504 exists on the TBC-24 board with the suffix -13 and higher.
For the TBC-24 board with the suffix -11 or -12, adjust RV500 only.



(5) Eject the alignment tape CR5-1B/CR5-1B PS.

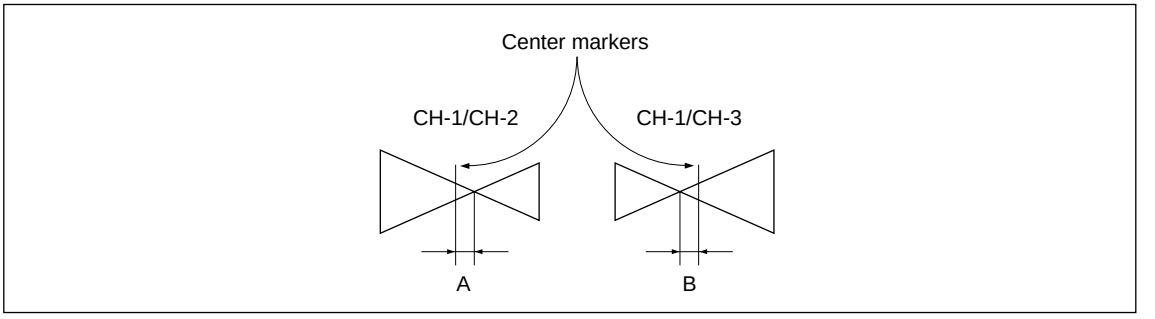


RV500 and RV504 on TBC-24 Board

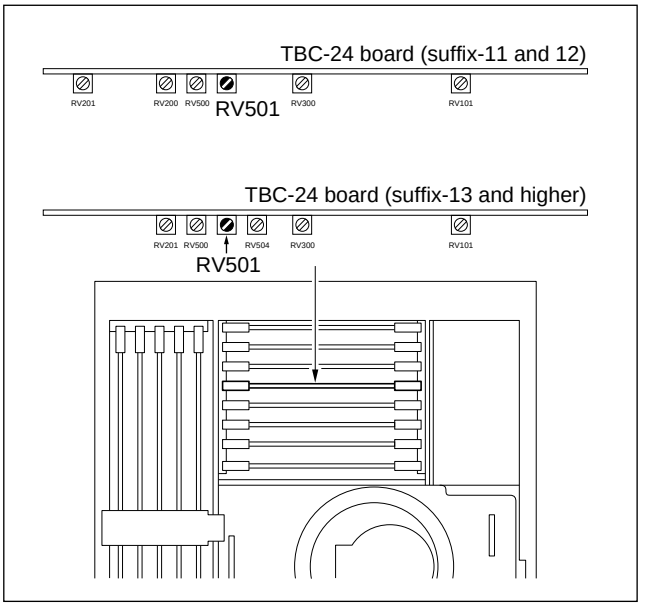
OXIDE adjustment [up to step (7)]

(6) Playback the bowtie signal portion (6:00 to 9:00) of the alignment tape CR5-2A or CR5-2A PS. (DNW-A100/A50/A45: CR5-2A, DNW-A100P/A50P/A45P: CR5-2A PS)

(7) Observe the bowtie dip point at which the CH-1 (Y) and CH-2 (B-Y) signals cross. Adjust so that the deviation between the center marker and bowtie dip point is within specification. Then observe the point at which the CH-1 (Y) and CH-3 (R-Y) signals cross and adjust in the same manner.
Adjustment point: ◓RV501/TBC-24(C-1)
Specifications: A = 0 ±10 ns
B = 0 ±10 ns



(8) Eject the alignment tape CR5-2A/CR5-2A PS.



RV501 on TBC-24 Board

6-4. Electrical Adjustment after Replacing the AT Head

Adjustment Items

No.	Item	Adjustment point		Test point
1	Preparation			
2	LAU PB frequency response adjustment (Audio head dumping adjustment)			
	OXIDE	CH1	⊘RV501/APR-12, ⊘RV500/APR-12 [S500/APR-12(A-1)]	AUDIO OUTPUT CH1
		CH2	⊘RV601/APR-12, ⊘RV600/APR-12 [S600/APR-12(G-1)]	AUDIO OUTPUT CH2
	METAL (DNW-A100P/A50P/A45P only)	CH1	⊘RV502/APR-12(A-1)	AUDIO OUTPUT CH1
		CH2	⊘RV602/APR-12(G-1)	AUDIO OUTPUT CH2
3	LAU Dolby level adjustment	CH1	⊘RV503/APR-12(C-1)	TP501/APR-12 (C-1)
		CH2	⊘RV604/APR-12(E-1)	TP601/APR-12 (E-1)
4	LAU PB level Adjustment	CH1	⊘RV504/APR-12(B-1)	AUDIO OUTPUT CH1
		CH2	⊘RV605/APR-12(F-1)	AUDIO OUTPUT CH2
5	LAU PB phase adjustment		⊘RV603/APR-12(F-1)	AUDIO OUTPUT CH1/CH2
6	LTC Erasure current adjustment		⊘LV300/TC-96(A-1)	TP301/TC-96 (B-1)
7	LTC PB level check		check	TP102/TC-96 (A-2)
8	LTC OA check		check	TP100/TC-96 (A-2) TP101/TC-96 (A-3)
9	LTC Erase ratio check		check	TP102/TC-96 (A-2)

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Note

When AES/EBU I/F kit BKNW-105 is equipped in the DNW, substitute MONITOR OUTPUT L/R connectors for AUDIO OUTPUT CH1/CH2 connectors respectively to measure.

To perform the electrical adjustments, the following equipment and fixtures are required.

- Audio signal generator: TEKTRONIX SG505-option 02 or equivalent
- Audio analyzer: TEKTRONIX AA501A-option 02 or equivalent
  Note The audio analyzer should be filtered through 80 kHz LPF throughout adjustment.
- Audio level meter: HEWLETT-PACKARD HP3400A or equivalent
- Band-pass filter (1 kHz)
- Time code generator: SONY BVG-1600 (for NTSC) / BVG-1600PS (for PAL) or equivalent
- Time code reader: SONY BVG-1500 (for NTSC) / BVG-1500PS (for PAL) or equivalent
- Oscilloscope: TEKTRONIX 2465B or equivalent
- Extension board: EX-556 (Part No. A-8277-212-A)
- Alignment tapes
  For DNW-A100/A50/A45: CR8-1A (Part No. 8-960-097-45) and SR5-1 (Part No. 8-960-075-01)
  For DNW-A100P/A50P/A45P: CR8-1A PS (Part No. 8-960-098-45), CR8-1B PS (Part No. 8-960-096-86), and SR5-1P (Part No. 8-960-075-51)
- Recording tape: BCT-SX series (Betacam SX cassette: SONY standard products)
  Note For this recording tape, prepare the virgin tape or no recorded tape that erased using the tape eraser, etc. in advance.

6-4-1. Preparation

Before beginning adjustment, fill up the customer settings of following shorting plugs on APR-12 and -13 boards, then set they to factory settings.
After adjustments are completed under the factory settings, return the shorting plugs to the customer setting positions and make a fine adjustment for each returned item.
Description about shorting plugs are given in the maintenance manual part 1, Sections 1-10-1 and 1-10-2.

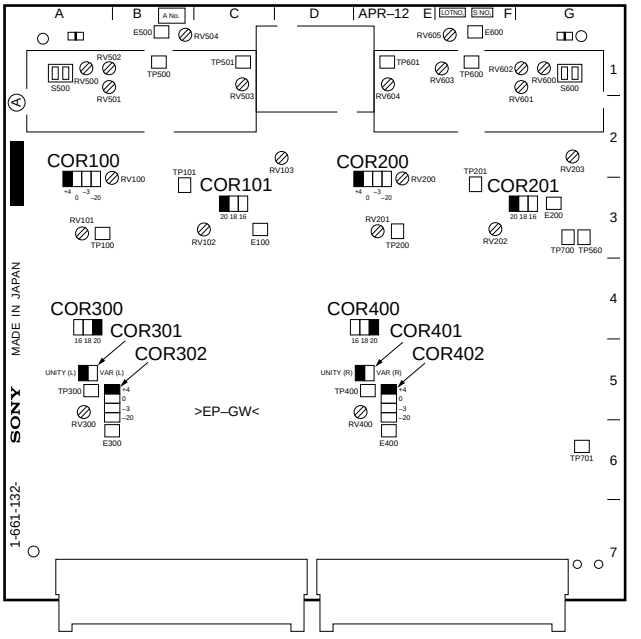
Setting the shorting plugs on APR-12 board

Ref. No.	Item	Setting at adjustment	Customer position (fill up)
COR100	Analog audio CH1 input level	+4	_____
COR101	Analog audio CH1 input head room	20	_____
COR200	Analog audio CH2 input level	+4	_____
COR201	Analog audio CH2 input head room	20	_____
COR300	Monitor L output head room	20	_____
COR301	Monitor L output level, unity or variable	UNITY(L)	_____
COR302	Monitor L output level	+4	_____
COR400	Monitor R output head room	20	_____
COR401	Monitor R output level, unity or variable	UNITY(R)	_____
COR402	Monitor R output level	+4	_____

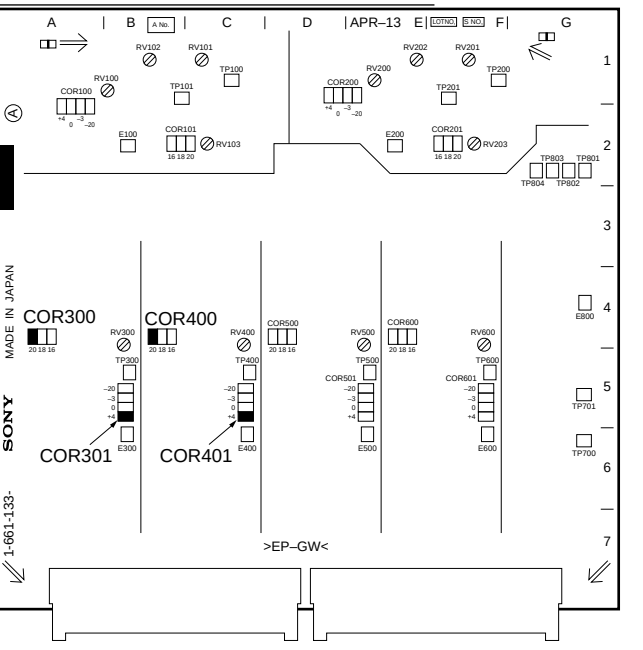
Setting the shorting plugs on APR-13 board

When the BKNW-105 is equipped in the DNW, skip this setting.

Ref. No.	Item	Setting at adjustment	Customer position (fill up)
COR300	Analog audio CH1 output head room	20	_____
COR301	Analog audio CH1 output level	+4	_____
COR400	Analog audio CH2 output head room	20	_____
COR401	Analog audio CH2 output level	+4	_____



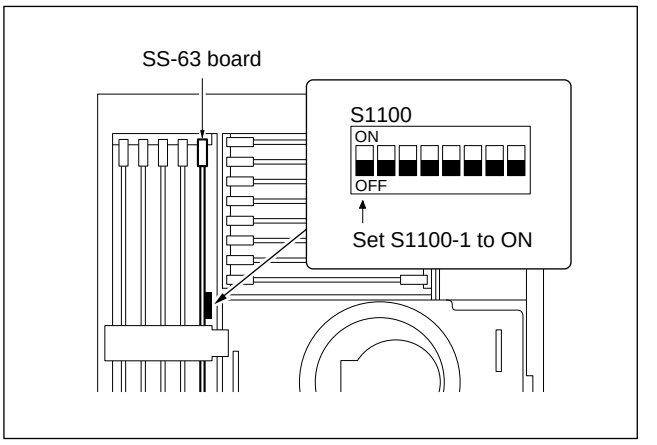
APR-12 Board (Side A)



APR-13 Board (Side A)

Setting of the DIP switch (DNW-A100P/A50P/A45P only)

Set S1100-1 on SS-63 board to ON to treat the extend menu of the setup menu. (See the right figure.)



S1100 on SS-63 Board

Check the video system

Turn on the power, and check that the video system is setting as follows:

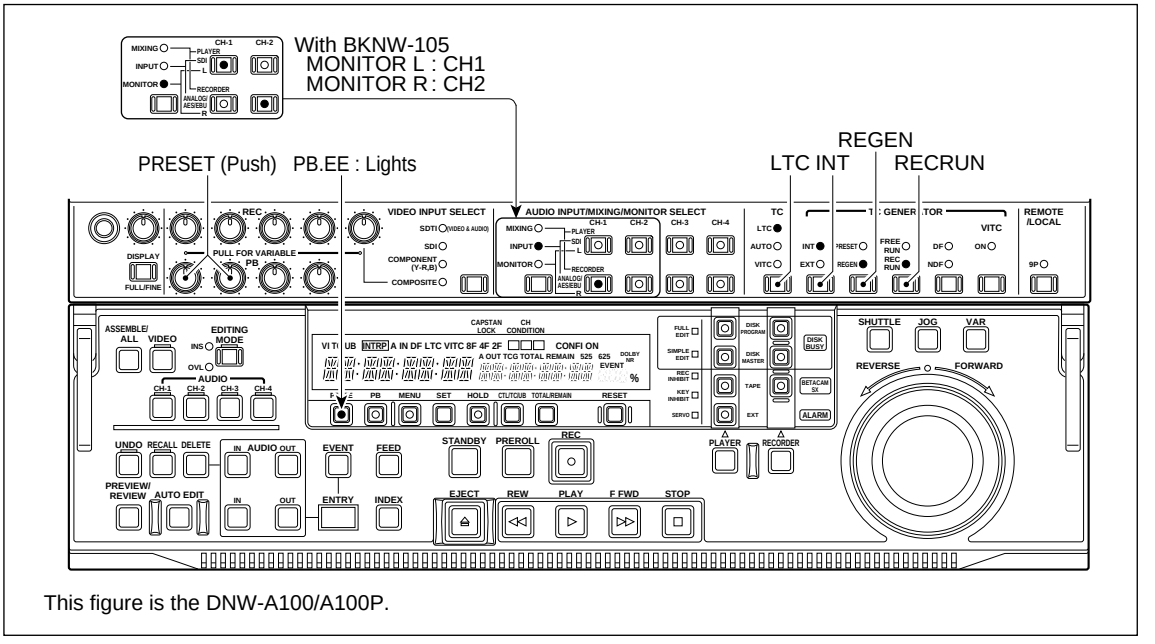
DNW-A100/A50/A45: 525/60 system

DNW-A100P/A50P/A45P: 625/50 system

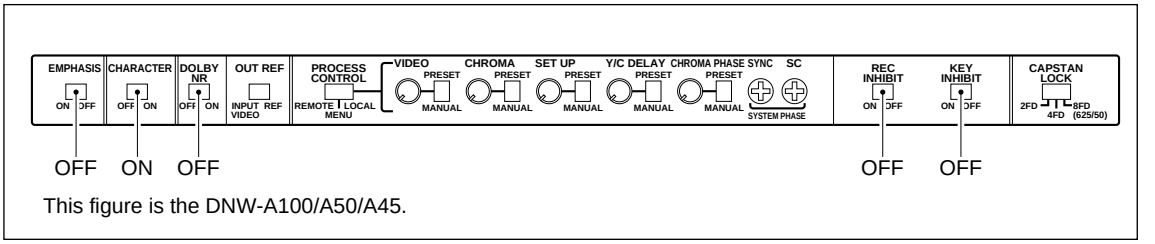
If differed, change the video system in the setup menu ITEM-013. (Refer to Section 7-2-2 of the operation manual.)

Setting of the control panels

Set switches on each control panel as shown below.



Upper/Lower Control Panels



Sub Control Panel

Setting of the setup extend menu (DNW-A100P/A50P/A45P only)

Set the ITEM-F01: AUDIO NR IN SP MODE to “SW”.

Notes

- To display the ITEM-F00 series, turn the search dial while pressing the PLAY button.
- After adjustments are completed, return the ITEM-F01 to “ON”.

6-4-2. LAU PB Frequency Response Adjustment

Measuring equipment: Audio analyzer (dB ratio measurement mode, 80 kHz LPF)

OXIDE

CH1 adjustment

1. Connect the input of audio analyzer to AUDIO OUTPUT CH1 connector.
   However, when the optional kit BKNW-105 is equipped in the DNW, connect the audio analyzer to MONITOR OUTPUT L connector.
2. Playback the following specified portions (−20 VU) of the alignment tape CR8-1A or CR8-1A PS, and perform the adjustments and checks.
   (DNW-A100/A50/A45: CR8-1A, DNW-A100P/A50P/A45P: CR8-1A PS)

Playback portion	Specifications[dB]		Adjustment point
	DNW-A100/A50/A45	DNW-A100P/A50P/A45P	
5:00 to 5:55 (1 kHz, −20 VU)	Measured value makes 0 dB (reference).	Measured value makes 0 dB (reference).	–
6:00 to 6:25 (40 Hz, −20 VU)	C.V. $^{+0.7}_{-1.7}$	C.V. $^{+0.7}_{-1.7}$	(Check only)
6:30 to 6:55 (7 kHz, −20 VU)	C.V. ±0.3	C.V. ±0.4	⊘RV501/APR-12(A-1)
7:00 to 7:25 (10 kHz, −20 VU)	C.V. ±0.3	C.V. ±0.4	(Check only)
7:30 to 7:55 (15 kHz, −20 VU)	C.V. $^{+0.3}_{-1.0}$	C.V. $^{-1.0}_{-1.7}$	⊘RV500/APR-12(A-1)

The correction values (C.V.) are given on the label of the alignment tape.

Note

If the specification for RV500 adjustment is not satified, readjust after changing the setting of S500/ APR-12(A-1).

CH2 adjustment

3. Connect the input of audio analyzer to AUDIO OUTPUT CH2 connector.
   However, when the optional kit BKNW-105 is equipped in the DNW, connect the audio analyzer to MONITOR OUTPUT R connector.
4. Playback the following specified portions (−20 VU) of the alignment tape CR8-1A or CR8-1A PS, and perform the adjustments and checks.
   (DNW-A100/A50/A45: CR8-1A, DNW-A100P/A50P/A45P: CR8-1A PS)

Playback portion	Specifications[dB]		Adjustment point
	DNW-A100/A50/A45	DNW-A100P/A50P/A45P	
5:00 to 5:55 (1 kHz, −20 VU)	Measured value makes 0 dB (reference).	Measured value makes 0 dB (reference).	–
6:00 to 6:25 (40 Hz, −20 VU)	C.V. $^{+0.7}_{-1.7}$	C.V. $^{+0.7}_{-1.7}$	(Check only)
6:30 to 6:55 (7 kHz, −20 VU)	C.V. ±0.3	C.V. ±0.4	⊘RV601/APR-12(G-1)
7:00 to 7:25 (10 kHz, −20 VU)	C.V. ±0.3	C.V. ±0.4	(Check only)
7:30 to 7:55 (15 kHz, −20 VU)	C.V. $^{+0.3}_{-1.0}$	C.V. $^{-1.0}_{-1.7}$	⊘RV600/APR-12(G-1)

The correction values (C.V.) are given on the label of the alignment tape.

Note

If the specification for RV600 adjustment is not satified, readjust after changing the setting of S600/ APR-12(G-1).

METAL

Note

Perform steps 5 through 8 for only DNW-A100P/A50P/A45P.

CH1 adjustment

5. Connect the input of audio analyzer to AUDIO OUTPUT CH1 connector.
   However, when the optional kit BKNW-105 is equipped in the DNW, connect the audio analyzer to MONITOR OUTPUT L connector.
6. Playback the following specified portions (−20 VU) of alignment tape CR8-1B PS, and perform the adjustment and checks.

Play back portion	Specifications[dB]	Adjustment point
5:00 to 5:55 (1 kHz, −20 VU)	Measured value makes 0 dB (reference).	–
6:00 to 6:25 (40 Hz, −20 VU)	C.V. $^{+0.7}_{-1.7}$	(Check only)
6:30 to 6:55 (7 kHz, −20 VU)	C.V. ±0.3	(Check only)
7:00 to 7:25 (10 kHz, −20 VU)	C.V. ±0.4	(Check only)
7:30 to 7:55 (15 kHz, −20 VU)	C.V. ±0.5	⊘RV502/APR-12(A-1)

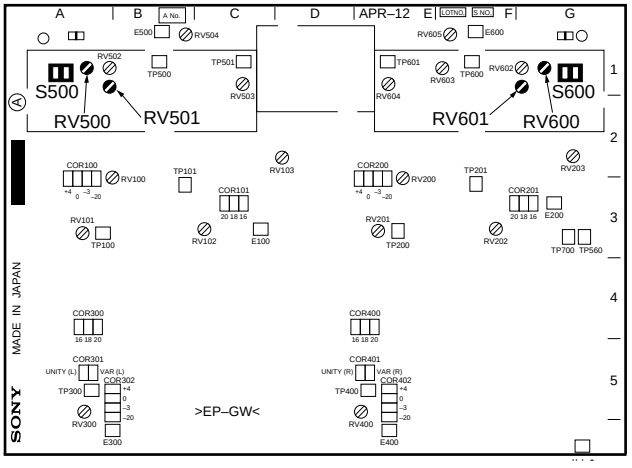
The correction values (C.V.) are given on the label of the alignment tape.

CH2 adjustment

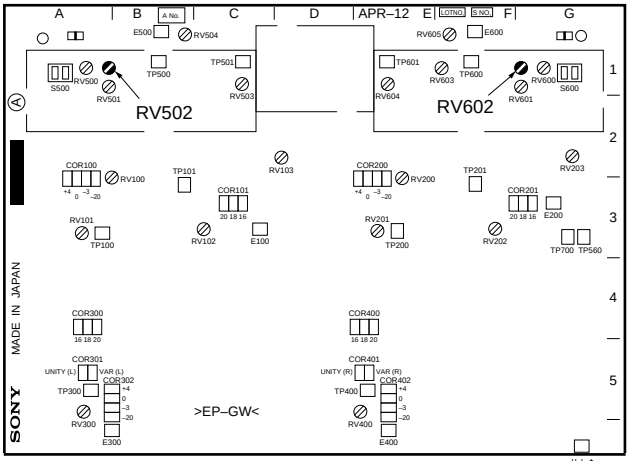
7. Connect the input of audio analyzer to AUDIO OUTPUT CH2 connector.
   However, when the optional kit BKNW-105 is equipped in the DNW, connect the audio analyzer to MONITOR OUTPUT R connector.
8. Playback the following specified portions (−20 VU) of alignment tape CR8-1B PS, and perform the adjustment and checks.

Play back portion	Specifications[dB]	Adjustment part
5:00 to 5:55 (1 kHz, −20 VU)	Measured value makes 0 dB (reference).	–
6:00 to 6:25 (40 Hz, −20 VU)	C.V. $^{+0.7}_{-1.7}$	(Check only)
6:30 to 6:55 (7 kHz, −20 VU)	C.V. ±0.3	(Check only)
7:00 to 7:25 (10 kHz, −20 VU)	C.V. ±0.4	(Check only)
7:30 to 7:55 (15 kHz, −20 VU)	C.V. ±0.5	⊘RV602/APR-12(G-1)

The correction values (C.V.) are given on the label of the alignment tape.



APR-12 Board (Side A) (For OXIDE)



APR-12 Board (Side A) (For METAL)

6-4-3. LAU Dolby Level Adjustment

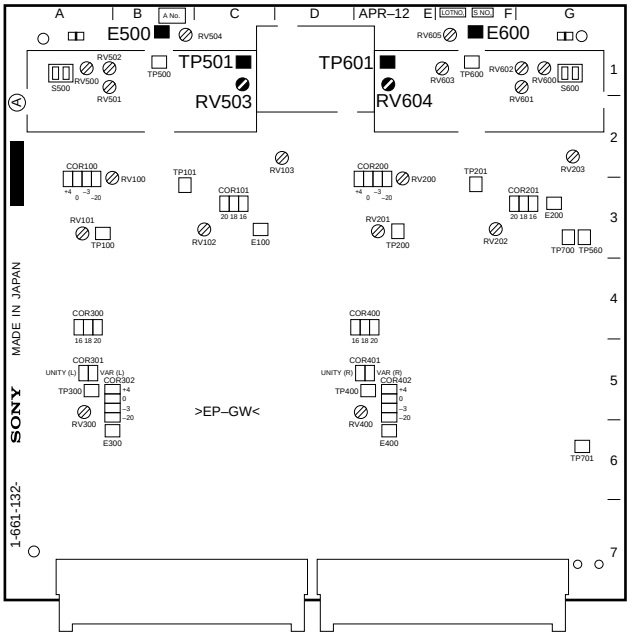
Measuring equipment: Audio level meter

CH1 adjustment

1. Connect the audio level meter to TP501/APR-12(C-1).
   GND : E500/APR-12(B-1)
2. Playback the 1 kHz, 0 VU portion (0:00 to 2:55) of alignment tape CR8-1A or CR8-1B PS, and perform the level adjustment.
   (DNW-A100/A50/A45: CR8-1A, DNW-A100P/A50P/A45P: CR8-1B PS)
   Adjustment point: ⊘RV503/APR-12(C-1)
   Specification: −10.0 ±0.2 dBu (0 dBu ≒ 0.775 V rms)

CH2 adjustment

3. Connect the audio level meter to TP601/APR-12(E-1).
   GND : E600/APR-12(F-1)
4. Playback the 1 kHz, 0 VU portion (0:00 to 2:55) of alignment tape CR8-1A or CR8-1B PS, and perform the level adjustment.
   (DNW-A100/A50/A45: CR8-1A, DNW-A100P/A50P/A45P: CR8-1B PS)
   Adjustment point: ⊘RV604/APR-12(E-1)
   Specification: −10.0 ±0.2 dBu (0 dBu ≒ 0.775 V rms)



APR-12 Board (Side A)

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6-4-4. LAU PB Level Adjustment

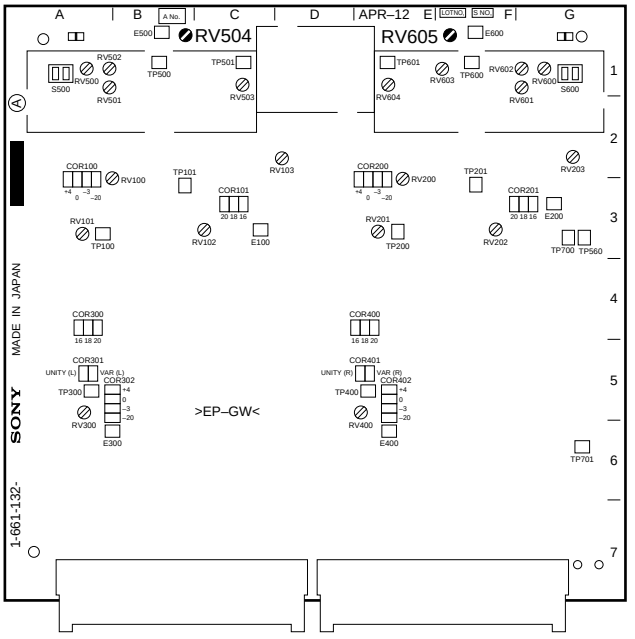
Measuring equipment: Audio analyzer (dBm measurement mode, 80 kHz LPF)

CH1 adjustment

1. Connect the input of audio analyzer to AUDIO OUTPUT CH1 connector.
   However, when the optional kit BKNW-105 is equipped in the DNW, connect the audio analyzer to MONITOR OUTPUT L connector.
2. Playback the 1 kHz, 0 VU portion (0:00 to 2:55) of alignment tape CR8-1A or CR8-1B PS, and perform the level adjustment.
   (DNW-A100/A50/A45: CR8-1A, DNW-A100P/A50P/A45P: CR8-1B PS)
   Adjustment point: ⊘RV504/APR-12(B-1)
   Specification: +4.0 ± 0.2 dBm (at 600 Ω load)

CH2 adjustment

3. Connect the input of audio analyzer to AUDIO OUTPUT CH2 connector.
   However, when the optional kit BKNW-105 is equipped in the DNW, connect the audio analyzer to MONITOR OUTPUT R connector.
4. Playback the 1 kHz, 0 VU portion (0:00 to 2:55) of alignment tape CR8-1A or CR8-1B PS, and perform the level adjustment.
   (DNW-A100/A50/A45: CR8-1A, DNW-A100P/A50P/A45P: CR8-1B PS)
   Adjustment point: ⊘RV605/APR-12(F-1)
   Specification: +4.0 ± 0.2 dBm (at 600 Ω load)



APR-12 Board (Side A)

6-4-5. LAU PB Phase Adjustment

Measuring equipment: Oscilloscope (X-Y mode)

1. Connect and set the oscilloscope as follows:
   CH-1: Pin 2 (X) of AUDIO OUTPUT CH1 connector [GND: Pin 1(G)], AC
   CH-2: Pin 2 (X) of AUDIO OUTPUT CH2 connector [GND: Pin 1(G)], AC
   However, when the optional kit BKNW-105 is equipped in the DNW, connect CH1 and CH2 to MONITOR OUTPUT L and R connectors respectively.
   CH-1: Pin 2 (X) of MONITOR OUTPUT L connector [GND: Pin 1(G)], AC
   CH-2: Pin 2 (X) of MONITOR OUTPUT R connector [GND: Pin 1(G)], AC
   Note
   An XLR-to-pigtail cable is very convenient to connect between the oscilloscope and the above-mentioned connectors. Prepare two XLR-to-pigtail cables for this adjustmemnt.
   And connect the XLR plug end of the cable to the above mentioned connector and the pigtailed end to the oscilloscope. The cables for CH1 and CH2 shall be the same in length and have the same wire color on the pigtailed end.
2. For the DNW-A100/A50/A45, playback the 10 kHz, −10 VU portion (3:00 to 4:55) of the alignment tape CR8-1A.
   For the DNW-A100P/A50P/A45P, playback the 15 kHz, 0 VU portion (3:00 to 4:55) of the alignment tape CR8-1B PS.
3. Observe the lissajous waveform on the oscilloscope.
4. Align the vertical and horizontal amplitudes of lissajous waveform to 60 mm square with the VOLTS/DIV and VAR controls of the oscilloscope.
5. Minimize the phase difference A of lissajous waveform.
   Adjustment point: ◓RV603/APR-12(F-1)
   Specification: A ≦ 5.2 mm (Refer to Figure 2.)

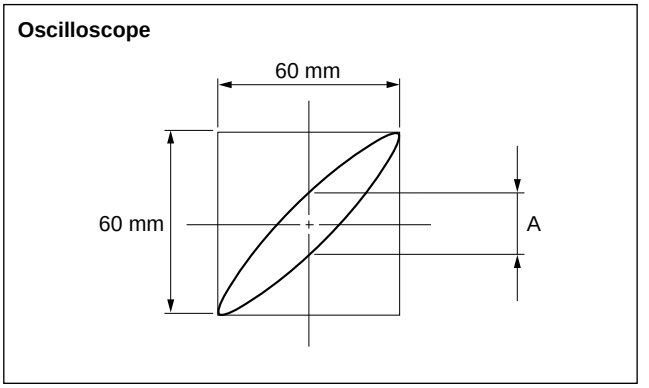
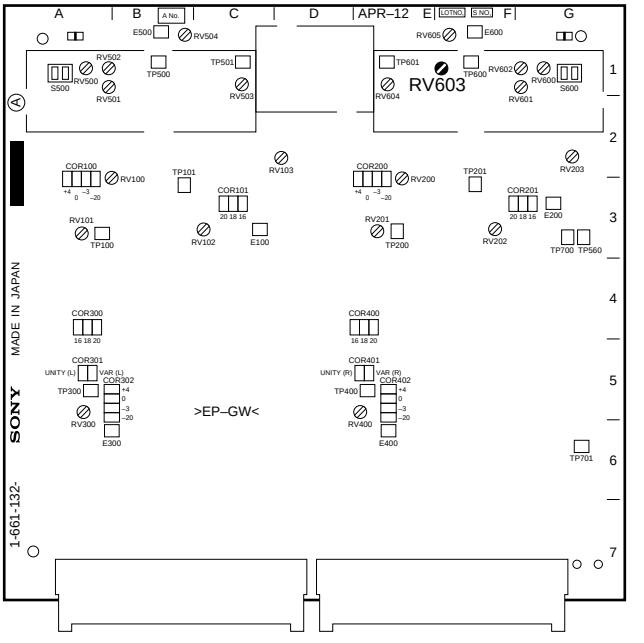


Figure 2. Waveform of LAU PB Phase Adjustment



APR-12 Board (Side A)

6-4-6. LTC Erasure Current Adjustment

Measuring equipment: Audio level meter (V rms measurement mode)
Oscilloscope

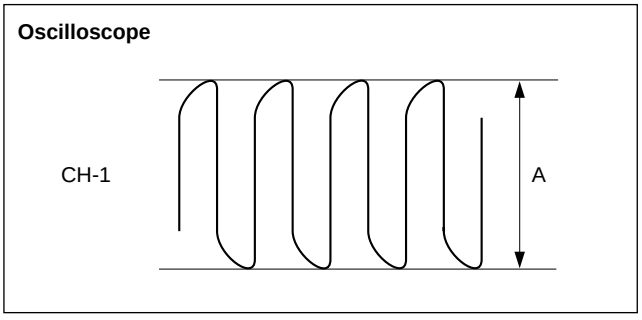
1. Connect the audio level meter to TP301 (B-1) on the TC-96 board.
   GND: E300/TC-96 (B-3)
2. Insert the recording tape, then put into the recording mode.
3. Check the level on the audio level meter.
   Adj. point: ⊘LV300/TC-96 (A-1)
   Specification: Maximum (110 mV rms or more: OK)
4. Disconnect the audio level meter and connect the oscilloscope to the same test point.
5. Check that no distortion is watched on the waveform.
6. Eject the recording tape.

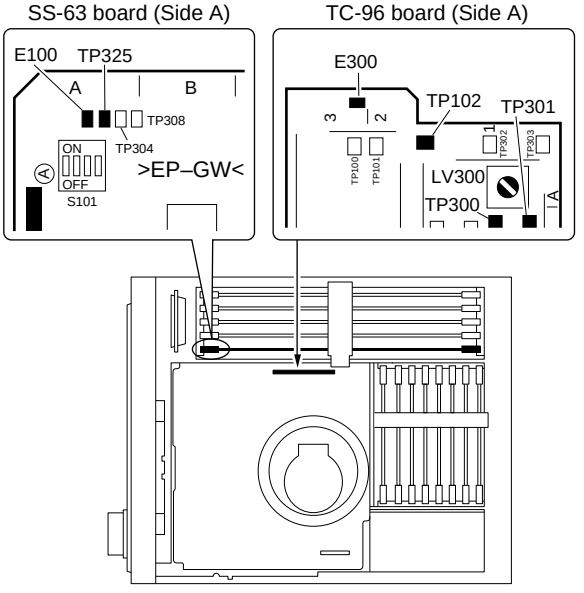
6-4-7. LTC PB Level Check

Measuring equipment: Oscilloscope

1. Connect and set the oscilloscope as follows:
   CH-1: TP102/TC-96 (A-2), GND: E300/TC-96 (A-3), DC 100 mV/DIV
   TRIG: TP325/SS-63 (A-1), GND: E100/SS-63 (A-1)
   TIME: 100 µs/DIV
2. Insert the alignment tape SR5-1 (525/60 system) or SR5-1P (625/50 system).
3. With the alignment tape playing back in following PB modes, check the level on the oscilloscope in each PB mode.
   PB modes: PLAY, REW, SHUTTLE (−5 times speed), SHUTTLE (−0.21 time speed)
   Specification: A ≧ 200 mV p-p (in each PB mode)

If the above specification is not satisfied, perform “7-1. Tape Path Adjustment” again.

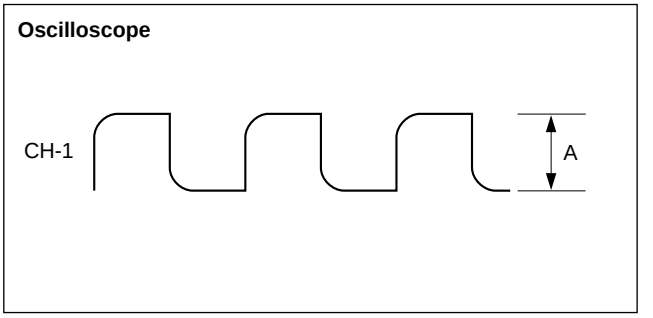




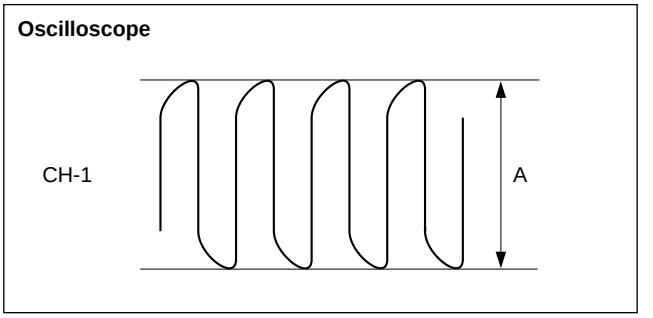
6-4-8. LTC OA Check

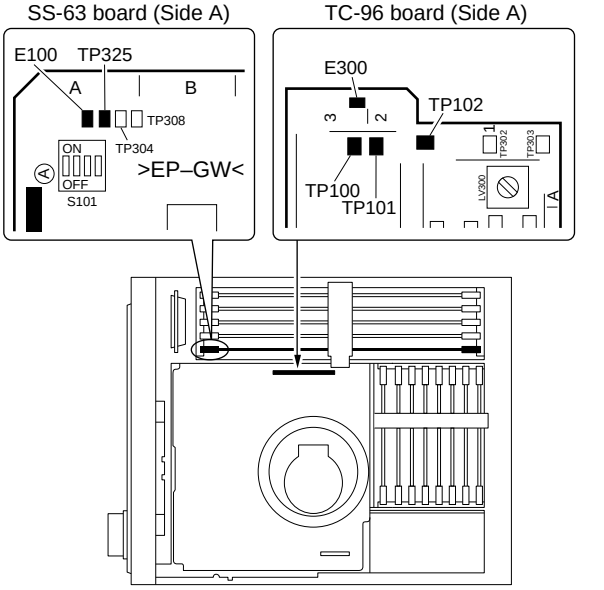
Measuring equipment: Oscilloscope
Time code generator
Time code reader

1. Connect the LTC output of the time code generator to TIME CODE IN connector of the DNW.
2. Connect and set the oscilloscope as follows:
   CH-1: TP100/TC-96 (A-2), GND: TP101/TC-96 (A-3), DC 100 mV/DIV
   TRIG: TP325/SS-63 (A-1), GND: E100/SS-63 (A-1)
   TIME: 100 µs/DIV
3. Insert the recording tape.
4. Check the level in recording mode.
   Specification: 60 ±5 mV p-p



5. Connect the LTC input of the time code reader to TIME CODE OUT connector of the DNW.
6. Change the connection of oscilloscope as follows:
   CH-1: TP102/TC-96 (A-2), GND: E300/TC-96 (A-3)
7. During play back the recorded portion at step 4 playing back in PLAY mode, check that the time code can be read on the time code reader.
8. During play back the recorded portion at step 4 playing back in following PB modes, check each level on the oscilloscope.
   PB modes: PLAY, REW, SHUTTLE (−5 times speed), SHUTTLE (−0.21 time speed)
   Specification: A ≧ 200 mV p-p (in each PB mode)

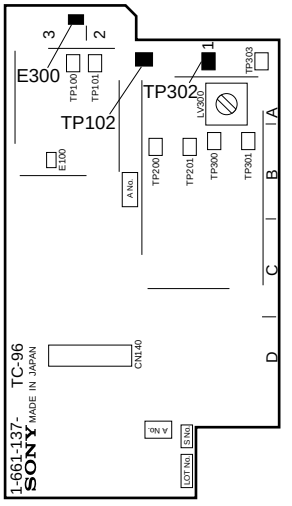




6-4-9. LTC Erase Ratio Check

Measuring equipment: Audio signal generator
Audio level meter (dB ratio measurement mode)
Band-pass filter (1 kHz)

1. Set following selectors of TC GENERATOR selection on the upper control panel.
   INT/EXT select: EXT
   PRESET/REGEN select: PRESET
2. Feed the audio signal (1 kHz, +7 dBu) from the audio signal generator to TIME CODE IN connector of DNW. (0 dBu ≒ 0.775 V rms)
3. Insert the recording tape, then record for 30 seconds.
   (Record the audio signal to the time code track.)
4. Short-circuit TP302/TC-96 (A-1) and E300/TC-96 (A-3) with a shorting clip.
5. Rewind the recorded portion by 15 seconds and record again.
   (Record the no signal to the time code track.)
6. Disconnect the shorting clip.
7. Connect the audio level meter through a 1 kHz band-pass filter to TP102/TC-96 (A-2).
   GND: E300/TC-96 (A-3)
8. During play back the audio-signal-recorded portion in PLAY mode, measure PB level on the audio analyzer.
   This measured audio level is a reference level (0 dB).
9. During play back the no-signal-recorded portion in PLAY mode, check PB level on the audio analyzer.
   Specification: −40 dB (Regard a level of the audio-signal-recorded portion as 0 dB.)



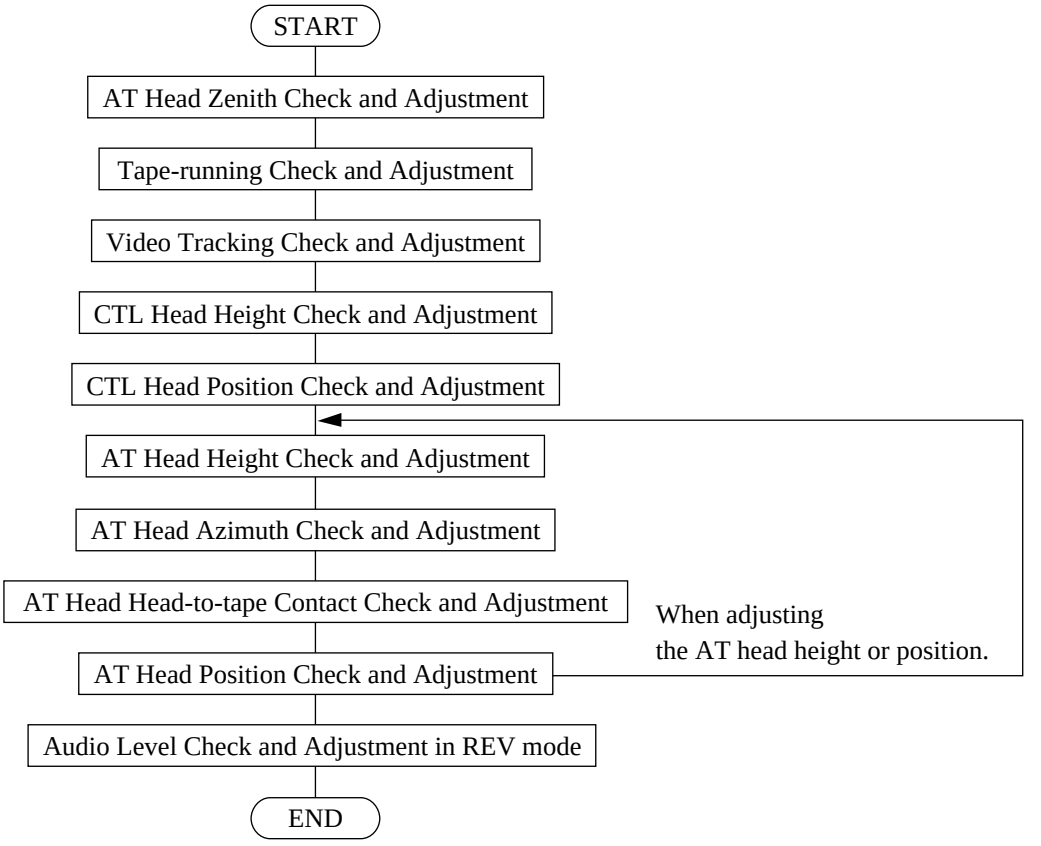
TC-96 Board (Side A)

Section 7
Tape Path Alignment

7-1. Tape Path Adjustment

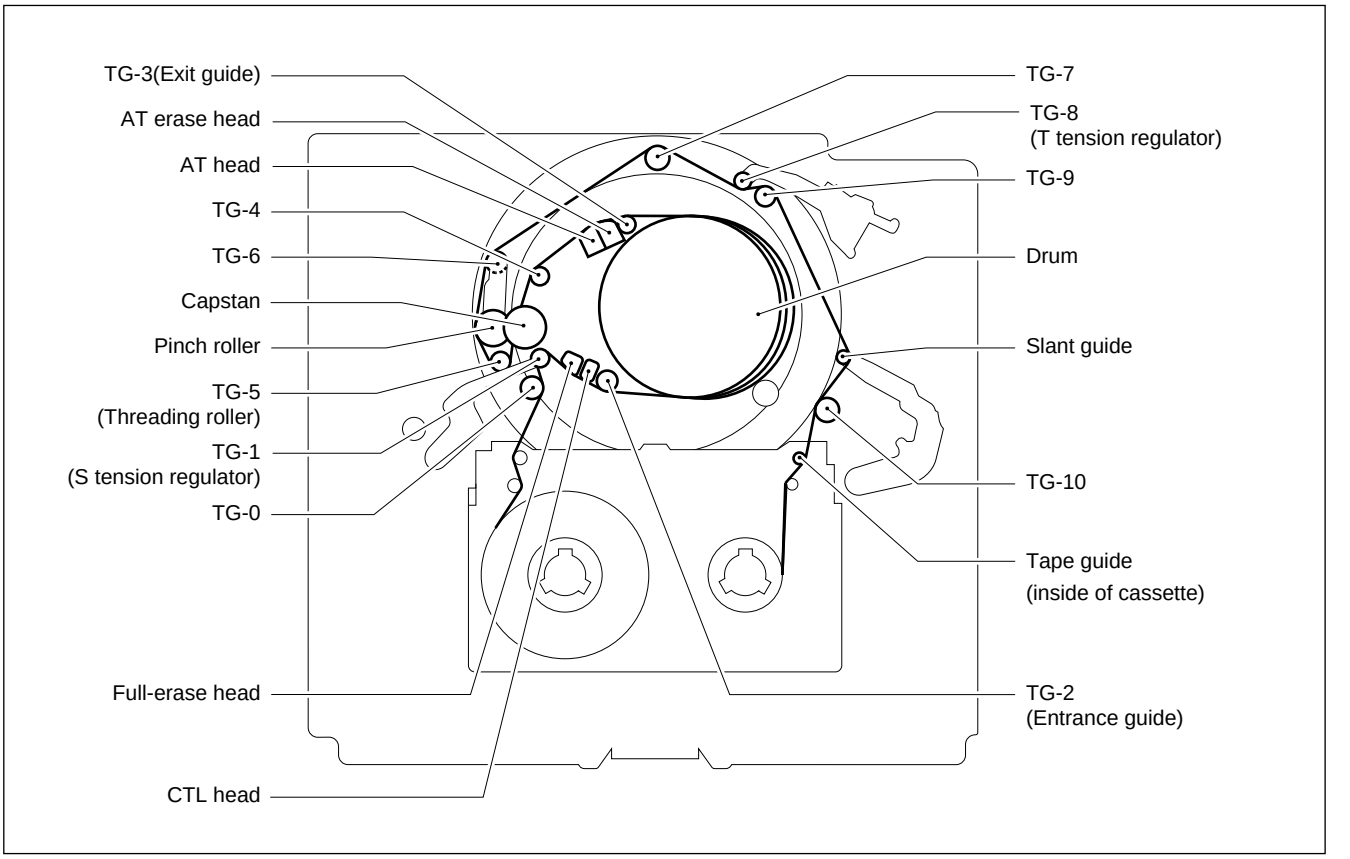
This section describes the checking and adjusting methods of the tape path system such as position, height, and slantness of tape guides and stationary heads.

1. Tape Path Adjustment Flow Chart


START
AT Head Zenith Check and Adjustment
Tape-running Check and Adjustment
Video Tracking Check and Adjustment
CTL Head Height Check and Adjustment
CTL Head Position Check and Adjustment
AT Head Height Check and Adjustment
AT Head Azimuth Check and Adjustment
AT Head Head-to-tape Contact Check and Adjustment
AT Head Position Check and Adjustment
When adjusting
the AT head height or position.
Audio Level Check and Adjustment in REV mode
END

2. Parts Location of the Tape-running System

Following figure describes the names of each part of the tape-running system.
It is illustrated in the threading end mode. " TG " in the figure means the tape guide.



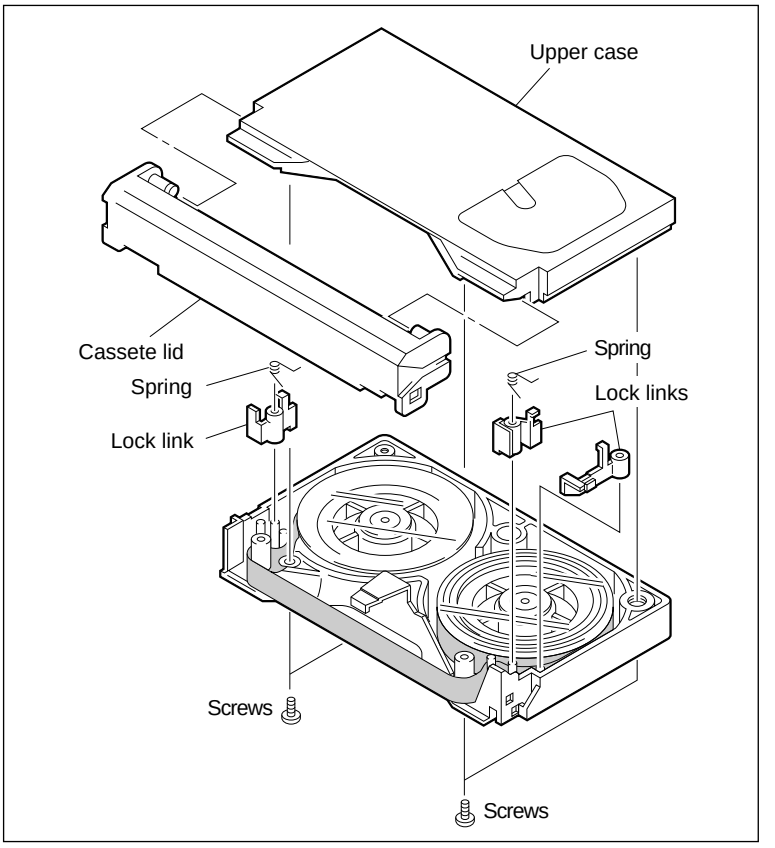
3. Cassette Compartment

- The tape path adjustment should be performed under the state that the cassette compertment is removed. If not, some checks and adjustments may be impossible.
- When the tape path adjustment is performed with the cassette compartment removed, the tape protection circuit is activated and the "ERROR" message may be displayed. In this case, turn the power off, then turn it on again.

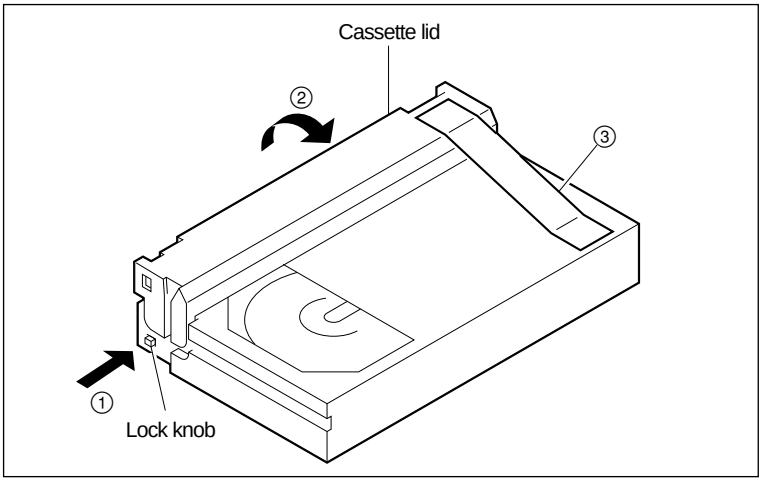
4. Cassette Tape

The tape path adjustment is performed after the cassette compertment removal.
Then, it is necessary to make a modification to the cassette tape and alignment tape that are used for tape path adjustment as follows.

(1) Cassette tape without lid
Disassembly the cassette tape, and take off the cassette lid, lock links and springs shown in the figure.



(2) Cassette tape with holding lid
Open the cassette lid (②) while pushing the lock knob (①) and fix the cassette lid using an adhesive tape (③).



When setting the cassette tape or the alignment tape on the VTR, put it to the cassette supports on the mechanical deck. And then, put a weight on the cassette so that it does not rise up. The weight about 1000 g is suitable.

5. Tracking Control

The method of the tracking control in the playing back mode is described below.
(1) Set a cassette tape and put a weight on the cassette so that it does not rise up. Weight about 1000 g is suitable.
(2) Press the PLAY button, then the tape is played back.
(3) Press S100 switch on the SS-63 board more than 1 sec..
In this state, RV100 variable resistor on the SS-63 board becomes the tracking control volume (and the LED D112 lights).
When the EJECT button is pressed or S100 switch on the SS-63 board is pushed more than 1 sec. after adjustment, the tracking control is fixed.

6. Preparation

(1) Remove the cassette compartment.
(Refer to Section 2-5 of Maintenance Manual Part 1.)
(2) Remove the video head cleaner.
(Refer to Section 5-4.)
Note
If the video head cleaner is attached, the tape running condition may be difficult to check. Therefore, remove the video head cleaner assembly before checking.
(3) Clean the following portions :
- Tape-running surfaces of upper drum and heads
(Refer to Section 5-2-3 of Maintenance Manual Part 1.)
- Lower drum's tape-running surface and lead surface
(Refer to Section 5-2-4 of Maintenance Manual Part 1.)
- Stationary heads (Refer to Section 5-2-5 of Maintenance Manual Part 1.)
- Tape-running system and tape cleaner
(Refer to Section 5-2-6 of Maintenance Manual Part 1.)

7. Alignment Tape

For the contents of the following alignment tape, refer to Section 1-4.

(1) SR2-1 (For 525/60 system) : 8-960-075-11
SR2-1P (For 625/50 system) : 8-960-075-61

(2) CR2-1B (For DNW-A100/A50/A45) : 8-960-096-01
CR2-1B PS (For DNW-A100P/A50P/A45P) : 8-960-096-51

(3) CR8-1A (For DNW-A100/A50/A45) : 8-960-097-45
CR8-1A PS (For DNW-A100P/A50P/A45P) : 8-960-098-45

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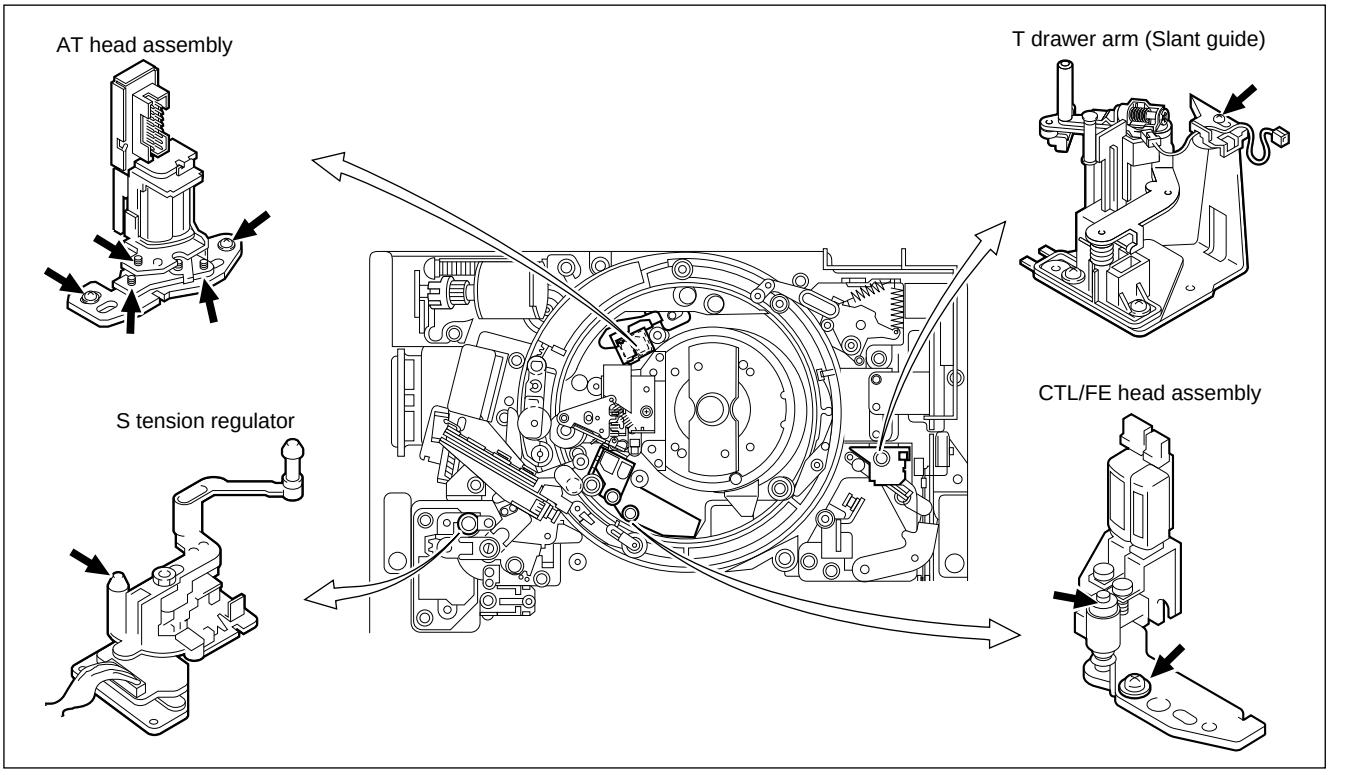
8. Locking Compound

When loosening the following screws, apply locking compound to the screws after adjustment is completed.
The locking compound that applied to other surrounding parts must be wiped off with gauze or soft cloth.

• Locking compound : 7-432-114-11



7-1-1. AT Head Zenith Check and Adjustment

Note

The AT head zenith check and adjustment are required only when the AT head is replaced.

Tools

- Flatness plate (SL-657): J-6086-570-A
- Cleaning cloth: 3-184-527-01
- Cleaning fluid: 9-919-573-01

Check

1. Unthreading End Mode

Check that the unit is in the unthreading end mode.

2. Check the AT Head Zenith

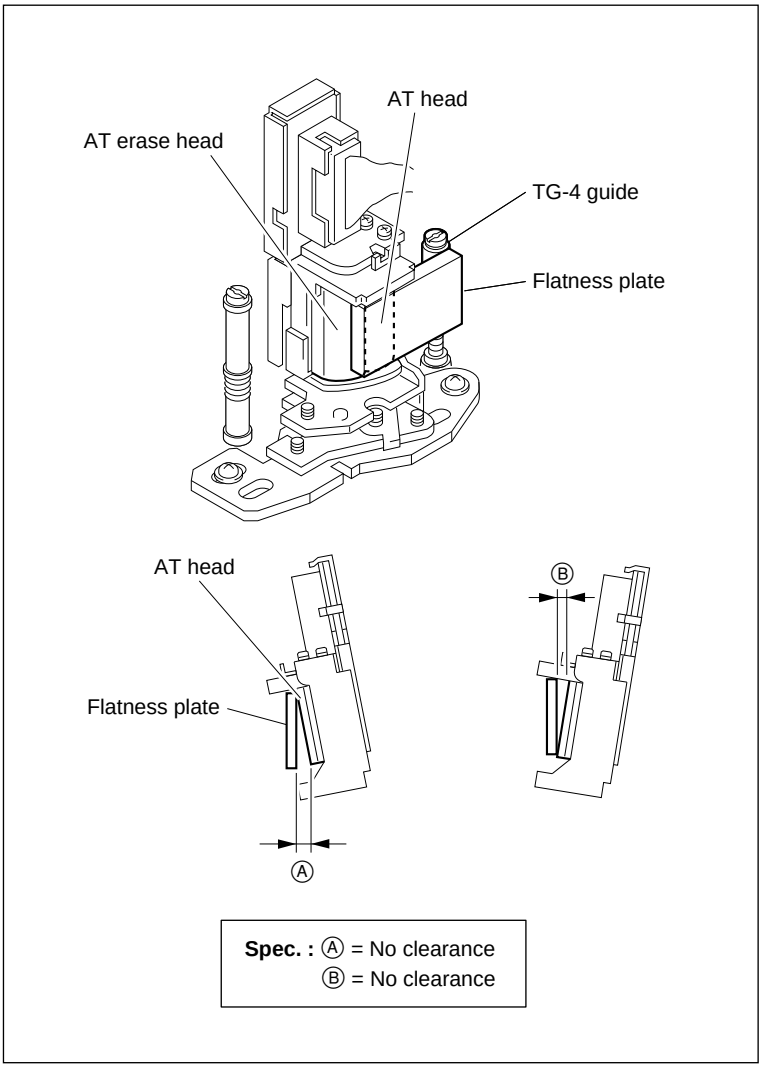
(1) Lightly place the flatness plate against the TG-4 guide and AT head.

Note

Be careful not to damage the surface of the AT head and TG-4 guide.

(2) Check that no clearance exists between the AT head and flatness plate as TG-4 guide reference in step (1).

If the specification is satisfied, perform step 7.
If not, perform steps 3 and later.



AT Head Zenith Check

Adjustment

3. Remove the CL Guide Rail

Remove the two screws, then remove the CL guide rail.

4. In Case of Clearance Exists at the Upper Part (Fig. 1)

Turn the zenith adjustment screw counterclockwise to satisfy the specification.

5. In Case of Clearance Exists at the Lower Part (Fig. 2)

Turn the zenith adjustment screw clockwise to satisfy the specification.

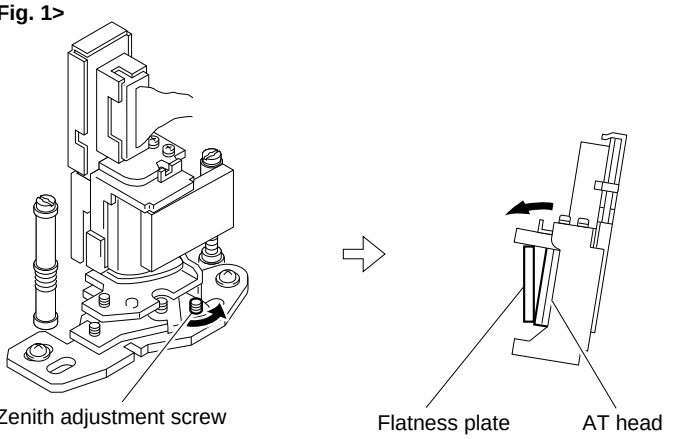
6. Attach the CL Guide Rail

Attach the CL guide rail with two screws.

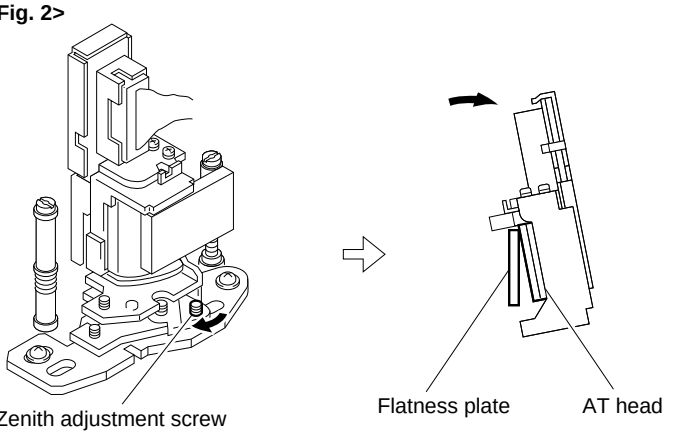
7. Cleaning

Clean the surface of the AT head, AT erase head, and TG-4 guide using a cleaning cloth moistened with cleaning fluid.

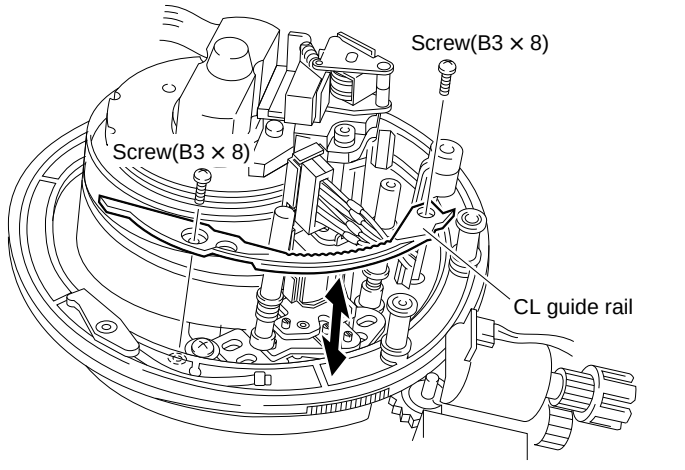
<Fig. 1>



<Fig. 2>



・Removing/Attaching the CL Guide Rail



AT Head Zenith Adjustment

7-1-2. Tape-running Check and Adjustment

Note

The tape-running is closely related to the height of the S and T reel tables. Check the height of the S and T reel tables before this tape running check and adjustment. (Refer to Section 5-9-4.)

Tape Approaching Side

Tools

- Betacam cassette (S cassette): BCT-30MA
- Adjustment mirror (circular): J-6080-029-A
- Tape guide adjustment driver (MW-261): J-6322-610-A

Check

1. Set the S Cassette Tape

(1) Set the reel tables to the S cassette position. (Refer to Section 5-1-3.)
(2) Set the S cassette and put a weight on the cassette so that it does not rise up. Weight about 1000 g is suitable.

2. Turn the Power On

3. PLAY Mode

Check that the tape-running condition satisfies specification 1.
If specification 1 is not satisfied, perform steps 9 and 10.

4. REV ×10 Mode

Check that the tape-running condition satisfies specification 1.
If specification 1 is not satisfied, perform steps 9 and 10.

5. F. FWD Mode

Check that the tape-running condition satisfies specification 1.
If specification 1 is not satisfied, perform steps 9 and 10.

6. REW Mode

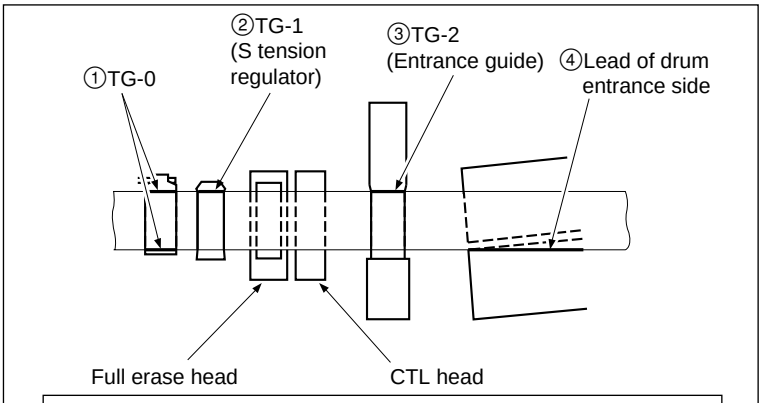
Check that the tape-running condition satisfies specification 1.
If specification 1 is not satisfied, perform steps 9 and 10.

7. REV ×1 Mode

Check that the tape-running condition satisfies specification 1.
If specification 1 is not satisfied, perform steps 9 and 10.

8. VAR ×–1/30 Mode

Check that the tape-running condition satisfies specification 1.
If specification 1 is not satisfied, perform steps 9 and 10.



Spec.1: ① TG-0
The tape runs without any curl at the upper and lower flanges.

② TG-1 (S tension regulator)
The tape runs in contact with the upper flange.
The tape curl is less than 1/10 of the tape width.

③ TG-2 (Entrance guide)
The tape runs in contact with the upper flange.
The tape curl is less than 1/10 of the tape width.

④ Lead of drum entrance side
The tape runs in contact with the drum lead and without any curl at the lead.

Tape Running Check at Tape Approaching Side

Adjustment

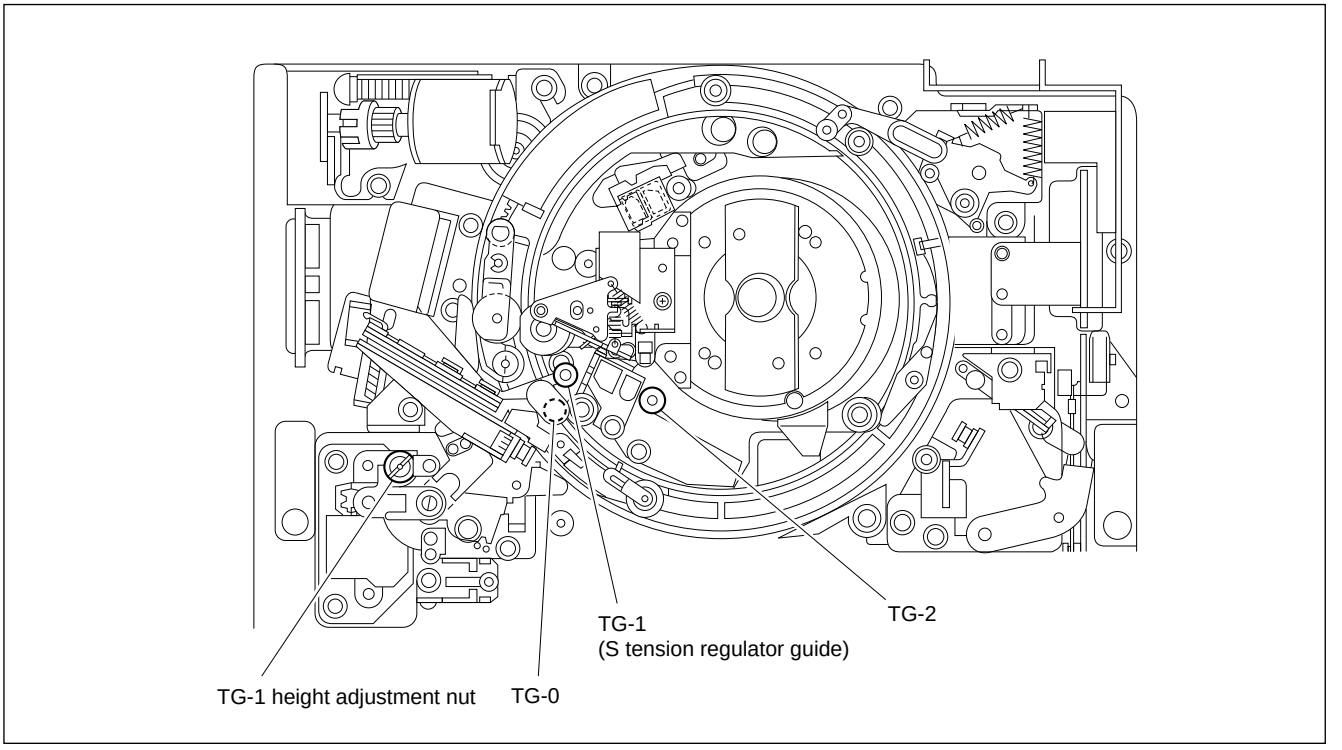
9. Adjust the TG-1 and TG-2 Height

(1) Put the unit into the PLAY mode.
(2) Turn the height adjustment nut of TG-1 and the upper flange of TG-2 using a tape guide adjustment driver and adjust the height of TG-1 and TG-2 so that the specification 1 is satisfied.

10. Recheck the Tape-running at Tape Approaching Side

Perform the tape-running check refer to steps 3 through 8, and perform the video tracking adjustment (Refer to Section 7-1-3).

If the specification 1 is not satisfied, perform the adjustment in step 9 again.



Tape-running Adjustment at Tape Appoaching Side

Tape Leaving Side

Tools

- Betacam cassette (S cassette): BCT-30MA
- Betacam cassette (L cassette) : BCT-90MLA
- Adjustment mirror (circular): J-6080-029-A
- Tape guide adjustment driver (MW-261): J-6322-610-A

Check

1. Set the S Cassette Tape

(1) Set the reel tables to the S cassette position. (Refer to Section 5-1-3.)
(2) Set the S cassette and put a weight on the cassette so that it does not rise up. Weight about 1000 g is suitable.

2. Turn the Power On

3. PLAY Mode

Check that the tape-running condition satisfies specification 2.
If specification 2 is not satisfied, perform steps 12 and 14.

4. REV × 10 Mode

Check that the tape-running condition satisfies specification 2.
If specification 2 is not satisfied, perform steps 13 and 14.

5 F. FWD Mode

Check that the tape-running condition satisfies specification 2.
If specification 2 is not satisfied, perform steps 12 and 14.

6. REW Mode

Check that the tape-running condition satisfies specification 2.
If specification 2 is not satisfied, perform steps 12 and 14.

7. REV × 1 Mode

Check that the tape-running condition satisfies specification 2.
If specification 2 is not satisfied, perform steps 12 and 14.

8. VAR × –1/30 Mode

Check that the tape-running condition satisfies specification 2.
If specification 2 is not satisfied, perform steps 13 and 14.

9. Set the L Cassette Tape

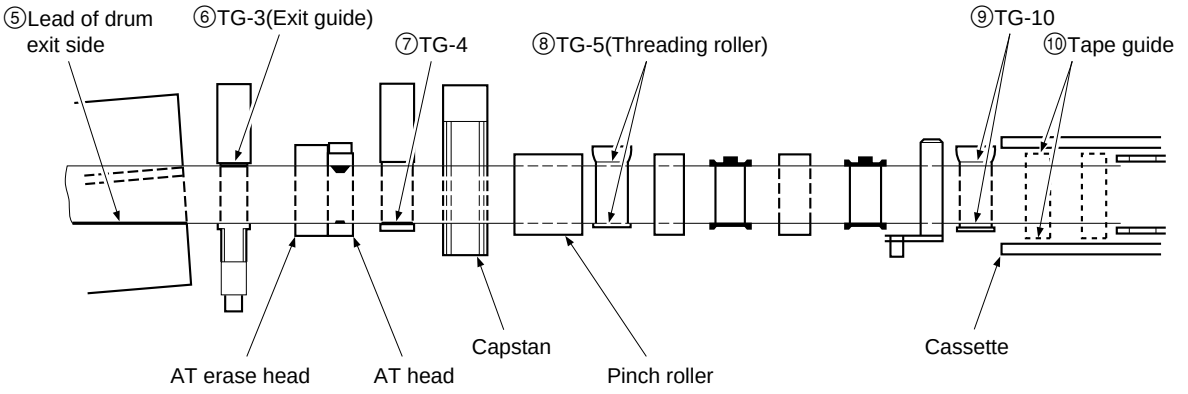
(1) Remove the S cassette.
(2) By pressing S100 switch (F-1/side A) on the SS-63 board, set the to the L cassette position.
(3) Set the L cassette and put a weight on the cassette so that it does not rise up. Weight about 1000 g is suitable.

10. Play Back the Tape

Play back the tape beginning portion of the L cassette.

11. Check the Tape-running at the T Tape Guide of Cassette and TG-10.

Check that the tape-running condition satisfies specification 3 at TG-10 and the T tape guide of the L cassette.
If specification 3 is not satisfied, perform step 15.



Spec.2: ⑤ Lead of drum exit side
The tape runs in contact with the drum lead and without any curl at the lead.

⑥
TG-3(Exit guide)
The tape runs in contact with the upper flange.
The tape curl is less than 1/10 of the tape width.

⑦
TG-4
The tape runs in contact with the lower flange.
The tape curl is less than 1/10 of the tape width.

⑧
TG-5(Threading roller)
The tape runs without any curl at the upper and lower flanges.

Spec.3: Play mode
⑨ TG-10
The tape runs not in contact with the upper and lower flanges.

⑩ Take-up side tape guide of cassette
The tape runs without any curl at the upper and lower portions of the tape guide.

Tape-running Check at Tape Leaving Side

Adjustment

12. Adjust the TG-3 (Exit Guide) and TG-4 Height

(1) Set the S cassette and put the unit into the PLAY mode.
(2) Turn the height adjustment nuts of TG-3 and TG-4 using a tape guide adjustment driver and adjust the height of TG-3 and TG-4 so that the specification 2 is satisfied.
(3) Perform the video tracking adjustment (Refer to Section.7-1-3).

13. Adjust the TG-5 (Threading Roller) Height (only when the specification is not satisfied in REV × 10 mode and VAR × –1/30 mode)

(1) Press the EJECT button.
(2) Remove the cassette tape.
(3) Turn the upper flange of TG-5 using a tape guide adjustment driver and adjust the height of TG-5 so that the specification 2 is satisfied.
(4) Set the S cassette tape and put the unit into the REV × 10 mode or VAR × −1/30 mode. At this time, check that the tape running condition satisfies specification 2.

    If it is not satisfied, repeat steps (1) through (4) mentioned above.

14. Recheck the Tape Running at Tape Leaving Side

Perform steps 2 through 8 again.

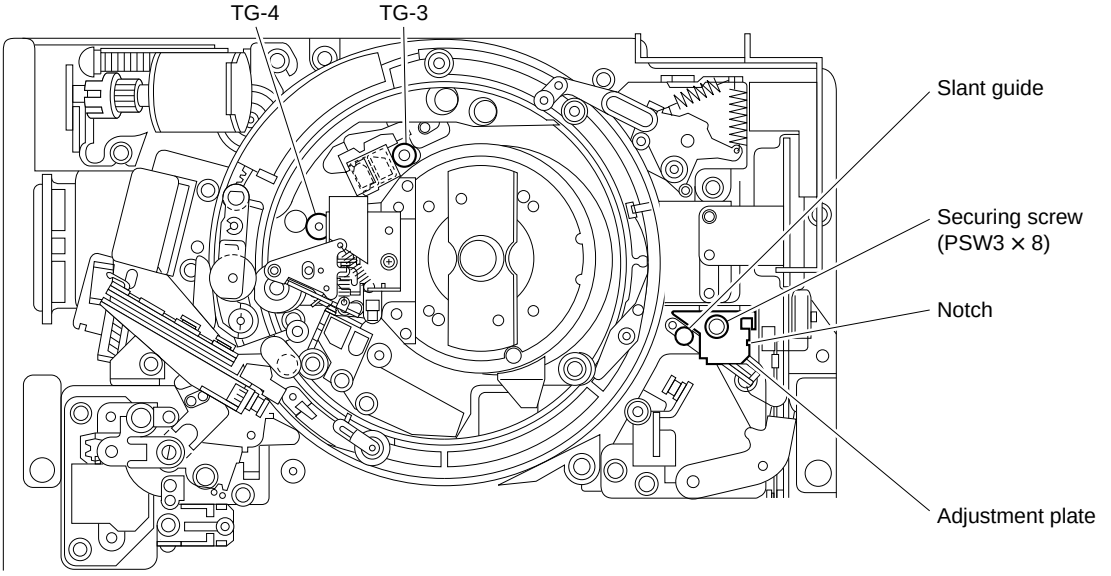
If the specification 2 is not satisfied, perform the adjustment in step 12 again.
(If the specification 2 is not satisfied in REV × 10 mode or VAR ×−1/30 mode, perform the adjustment in step 13 again.)

15. Adjust the Slant Guide Slantness

(1) Loosen the fixing screw of the adjustment plate by 1/4 to 1/2 turn.
(2) Insert a 3 mm flatbladed screwdriver into the notch of the adjustment plate.
(3) Turn the screwdriver to adjust the slantness of the slant guide so that specification 3 is satisfied.
(4) Tighten the screw loosened in step (1).
(5) Recheck that specification 3 is satisfied referring to steps 9 through 11.

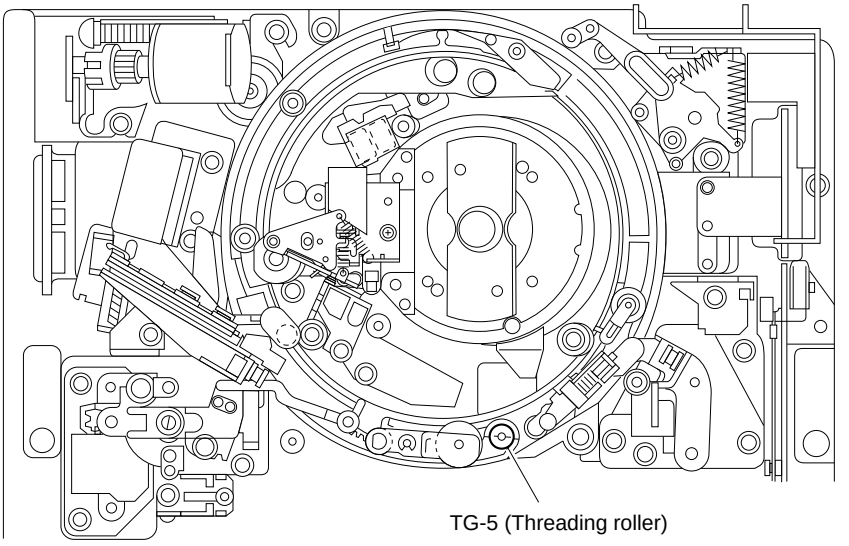
    If it is not satisfied, repeat steps (1) through (5) mentioned above.

・TG-3 and TG-4 height adjustment/slant guide slantness adjustment



・TG-5 Height adjustment (Only when the specification is not satisfied in REV × 10 mode or VAR × –1/30 mode)

<Unthreading end mode>



Tape-running Adjustment at Tape Leaving Side

7-1-3. Video Tracking Check and Adjustment

Tools

- Alignment tape SR2-1 (For 525/60 system): 8-960-075-11
- Alignment tape SR2-1P (For 625/50 system): 8-960-075-61
- Alignment tape CR2-1B (For DNW-A100/A50/A45): 8-960-096-01
- Alignment tape CR2-1B PS (For DNW-A100P/A50P/A45P): 8-960-096-51
- Oscilloscope (Tektronix 2465B or equivalent)
- Adjustment mirror (circular): J-6080-029-A
- Tape guide adjustment driver (MW-261): J-6322-610-A

Preparation

1. Turn the Power Off

2. Connect the Oscilloscope

<For DNW-A100/A100P>
CH-1: TP300/EQ-56 board (A1A5 signal)
CH-2: TP100/EQ-56 board (A1A5 SEL signal)
TRIG: TP325/SS-63 board (SS GOP signal)

<For DNW-A50/A45/A50P/A45P>
CH-1: TP500/EQ-56 board (A2A6 signal)
CH-2: TP100/EQ-56 board (A2A6 SEL signal)
TRIG: TP325/SS-63 board (SS GOP signal)

Oscilloscope setting:
CH-1: 200 mV/DIV
CH-2: 5 V/DIV
TIME: 2 ms/DIV

3. Set the Alignment Tape

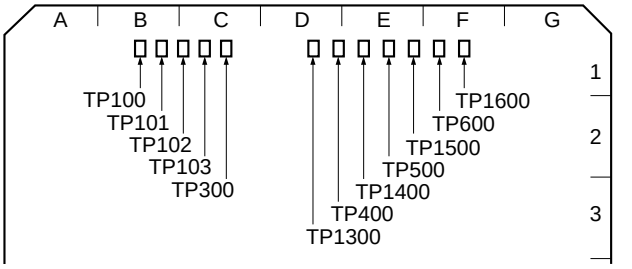
Set the SR2-1/P and put a weight on the cassette so that it does not rise up.
Weight about 1000 g is suitable.

- Connection of the oscilloscope

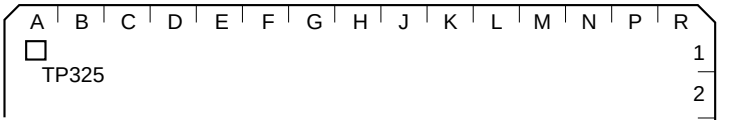
<For DNW-A100/A100P>
CH-1: TP300/EQ-56 board (A1A5 signal)
CH-2: TP100/EQ-56 board (A1A5 SEL signal)
TRIG: TP325/SS-63 board (SS GOP signal)

<For DNW-A50/A45/A50P/A45P>
CH-1: TP500/EQ-56 board (A2A6 signal)
CH-2: TP100/EQ-56 board (A2A6 SEL signal)
TRIG: TP325/SS-63 board (SS GOP signal)

<EQ-56 board, side A>



<SS-63 board, side A>



Preparation

Check

4. Turn the Power On

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5. Check the PB Head Head-to-tape Contact

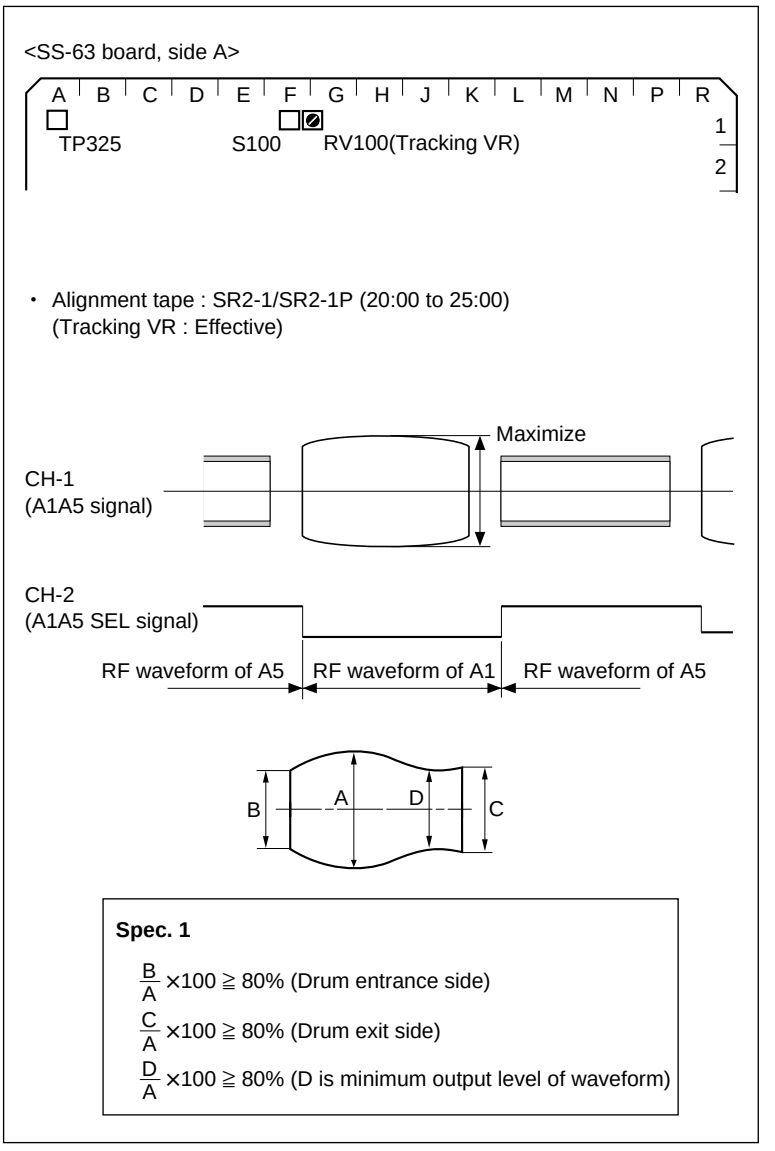
(1) Play back the SR2-1/P (20:00 to 25:00).
(2) Push S100 switch on the SS-63 board more than 1 sec. so that the tracking VR becomes to be effective.
The waveform is displayed on the oscilloscope as shown in the figure.
(3) Turn the tracking VR so that the output level of the center portion of RF waveform of A1 channel is maximized.
(4) Check that RF waveform of A1 channel satisfies the spec.1 in a state of procedure (3).
(5) Maximize the output level of RF waveform of A5 channel, check that RF waveform of A5 channel satisfies the spec.1.
(6) Change the connections of CH-1 and CH-2 of the oscilloscope as follows, and perform the check from steps (1) through (5) in the same way.

<For DNW-A100/A100P>
- CH-1: TP500, CH-2: TP100
- CH-1: TP400, CH-2: TP101
- CH-1: TP600, CH-2: TP101
- CH-1: TP1300, CH-2: TP102
- CH-1: TP1500, CH-2: TP102
- CH-1: TP1400, CH-2: TP103
- CH-1: TP1600, CH-2: TP103

(All of these TPs are on the EQ-56 board.)

<For DNW-A50/A45/A50P/A45P>
- CH-1: TP1500, CH-2: TP102
- CH-1: TP600, CH-2: TP101
- CH-1: TP1600, CH-2: TP103

(All of these TPs are on the EQ-56 board.)



PB Head Head-to-tape Contact Check

Note

The signal that is output from each TP is as shown below.

TP100 (A1A5 SEL signal)
TP101 (A3A7 SEL signal)
TP102 (B1B5 SEL signal)
TP103 (B3B7 SEL signal)

TP300 (A1A5 signal)
TP400 (A3A7 signal)
TP500 (A2A6 signal)
TP600 (A4A8 signal)
TP1300 (B1B5 signal)
TP1400 (B3B7 signal)
TP1500 (B2B6 signal)
TP1600 (B4B8 signal)

6. Check the Y/C Head Head-to-tape Contact

(1) Connect the oscilloscope.
CH-1: TP500/EQ-56 board (A2A6 signal)
CH-2: TP1500/EQ-56 board (B2B6 signal)
TRIG: TP100/EQ-56 board (A1A5 SEL signal)
Oscilloscope setting :
CH-1 : 200 mV/DIV
CH-2 : 200 mV/DIV
TIME : 5 to 2 ms/DIV

Note

The Ya and Yb signals of Betacam/Betacam SP are output from TP500 under playing back the CR2-1B/PS. In the same way, the Ca and Cb signals are output from TP1500.

(2) Press the EJECT button so that the unit put into the unthreading end state and remove the SR2-1/P.
At the same time, the tracking VR becomes to be not effective.
(3) Set the CR2-1B/PS and put a weight on the cassette so that it does not rise up.
Weight about 1000 g is suitable.
(4) Press the PLAY button to play back the CR2-1B/PS. (Any portion playback is acceptable)
The waveform is displayed on the oscilloscope as shown in the figure.
(5) Check that the RF waveform of Ya, Yb and the RF waveform of Ca, Cb satisfy the specification 2.

7. Mode Setting (REC Head PB)

(1) Press S1101 switch on the SS-63 board to enter the maintenance mode.
(2) Set the cursor "∗" to the "M0 : TAPE MAINTENANCE" and press the SET button.
(3) Set the cursor to the "C4 : OTHERS" and press the SET button.
(4) Set the cursor to the "C48 : PATH MODE SEL" and press the SET button.
(5) Check that the "Switching PB" is indicated, and press the SET button.
Then, □ mark is indicated at the right up corner on the monitor.

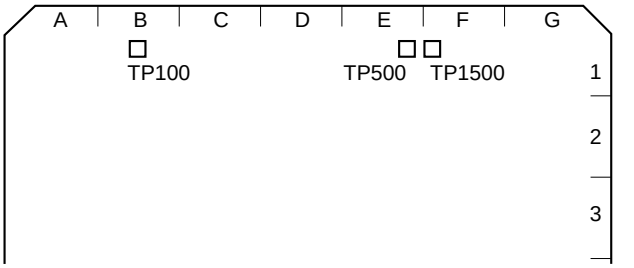
Note

Refer to Section 4 of Maintenance Manual Part 1 "Maintenance Mode" for more information about the maintenance mode.

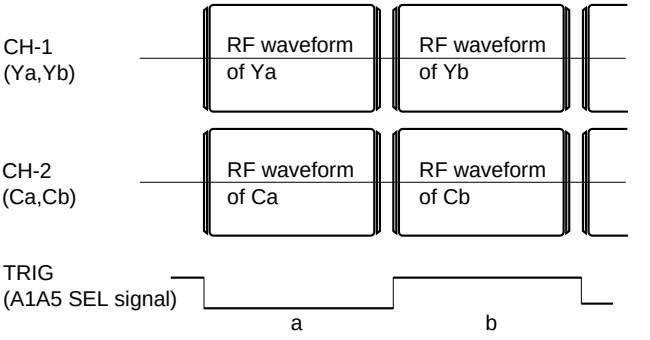
- Connection of the ocsilloscope

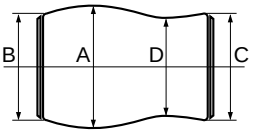
CH-1: TP500/EQ-56 board (A2A6 signal)
CH-2: TP1500/EQ-56 board (B2B6 signal)
TRIG: TP100/EQ-56 board (A1A5 SEL signal)

<EQ-56 board, side A>



- Alignment tape : CR2-1B/CR2-1B PS (Any portion)
(Tracking VR : Not effective)





Spec. 2

$\frac{B}{A} \times 100 \geqq 85\%$ (Drum entrance side)

$\frac{C}{A} \times 100 \geqq 85\%$ (Drum exit side)

$\frac{D}{A} \times 100 \geqq 85\%$ (D is minimum output level of waveform)

Y/C Head Head-to-tape Contact Check

8. REC B Head Output Check

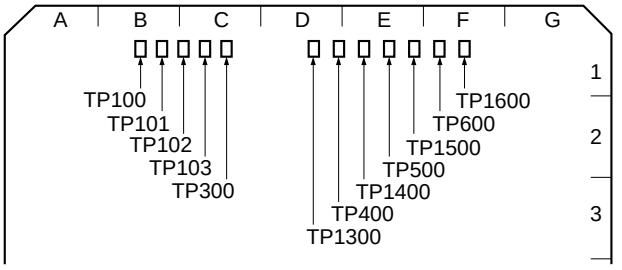
(1) Connect the oscilloscope.
CH-1: TP1600/EQ-56 board (B4B8 signal)
TRIG: TP325/SS-63 board (SS GOP signal)
Oscilloscope setting
CH-1: 50 mV/DIV
TRIG: 5 V/DIV
TIME: 5 ms

(2) Play back the SR2-1/P (15:00 to 20:00).

(3) Check that RF waveform is output from CH-1.(Spec.3)

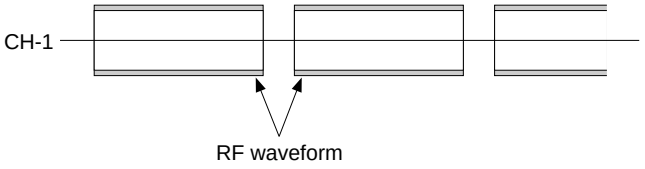
・ Oscilloscope
CH-1: TP1600/EQ-56 board (B4B8 signal)
TRIG: TP325/SS-63 board (SS GOP signal)

<EQ-56 board, side A>



<SS-63 board, side A>

・ Alignment tape: SR2-1/P (15:00 to 20:00)



Spec. 3 : RF waveform is output.

9. PLAY Mode

(1) Connect the oscilloscope.
CH-1: TP106/SS-63 board
(AB EVEN ENV signal)
TRIG: TP325/SS-63 board (SS GOP signal)
Oscilloscope setting:
CH-1: 1 V/DIV
TRIG: 5 V/DIV
TIME: 5 ms/DIV

(2) Play back the SR2-1/P (00:00 to 15:00).

(3) Push S100 switch on the SS-63 board more than 1 sec. so that the tracking VR becomes to be effective.

(4) Turn the tracking VR so that the output level of RF envelope waveform is maximized.

(5) Turn RV100 on the SS-63 board clockwise so that the center portion of the RF envelope waveform makes 80% of the maximum output level.

(6) At the state of step (5), check that the RF envelope waveform satisfies specification 4.

Note

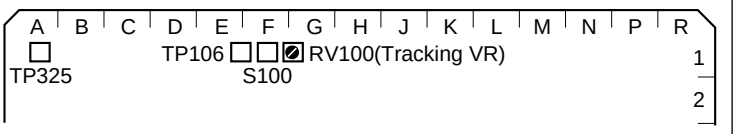
If the level fluctuates, read the average level.

(7) If the level fluctuates, turn RV100 on the SS-63 board so that the output level in the center portion of the RF envelope waveform is maximum, and check that the fluctuation amounts satisfy specification 5.

If specifications 4 and 5 are not satisfied, perform the adjustment (at the Drum Entrance Side or the Drum Exit Side) in steps 12 and later.

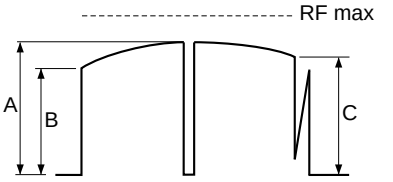
– Continued on the next page. –

<SS-63 board, side A>



• Alignment tape : SR2-1/SR2-1P (00:00 to 15:00)

<Head-to-tape contact>



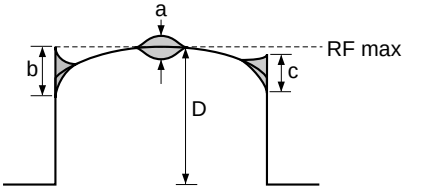
A = RF max × 0.8

Spec.4: $\frac{B}{A} \times 100 \geqq 70\%$

$\frac{C}{A} \times 100 \geqq 70\%$

(Output levels (B and C) at the drum entrance side and exit side are more than 70% of the center level(A).)

<Fluctuation>



D = Average maximum level at waveform center

Spec.5: $\frac{a}{D} \times 100 \leqq 20\%$

$\frac{b}{D} \times 100 \leqq 20\%$

$\frac{c}{D} \times 100 \leqq 20\%$

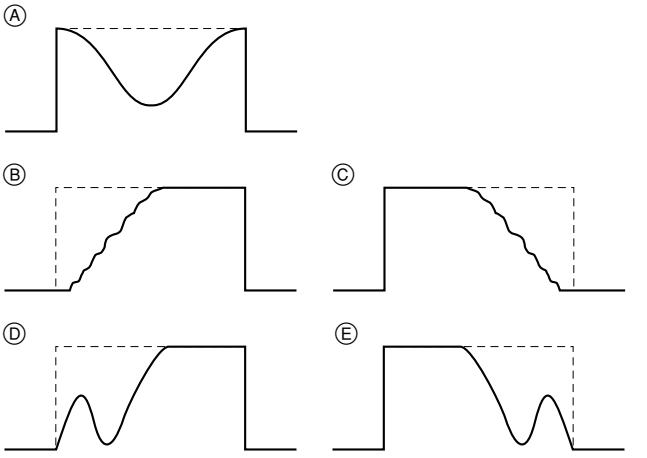
(Fluctuation amounts (a, b, c) at the drum center portion, entrance side and exit side are less than 20% of the average maximum level (D).)

If the output waveform is extremely abnormal condition as shown in Fig.1 after replacing the upper drum assembly, perform the upper drum replacement again.

- Upper drum assembly replacement (Refer to Section 5-2.)

<Fig. 1>

- Abnormal waveform (For example)



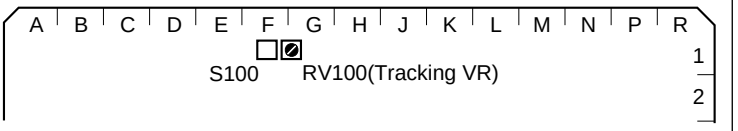
Video Tracking Check (PLAY)

10. F. FWD and REW Mode

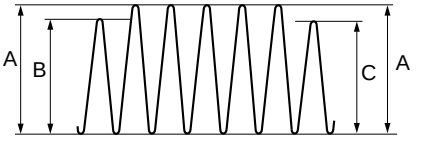
(1) Press the PLAY button and play back the SR2-1/P (00:00 to 15:00).
(2) Put the unit into the F. FWD mode and check that the RF waveform satisfies specifications 6 and 7.
(3) Put the unit into the REW mode and check that the RF waveform satisfies specifications 6 and 7.

If specifications 6 and 7 are not satisfied, perform the adjustment (at the Tape Approaching Side or Tape Leaving Side) in steps 12 and later.

<SS-63 board, side A>



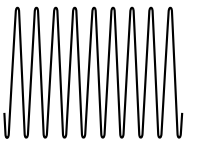
- Alignment tape : SR2-1/SR2-1P (00:00 to 15:00)
  (Tracking VR : Not effective)



Spec. 6 : $\frac{B}{A} \times 100 \geqq 70\%$ (Drum entrance side)
$\frac{C}{A} \times 100 \geqq 70\%$ (Drum exit side)

- Alignment tape : SR2-1/SR2-1P (00:00 to 15:00)
  (Tracking VR : Not effective)

Spec. 7 : No waveform lacking exists.



Video Tracking Check (F. FWD, REW)

11. REW Mode to PLAY Mode

(1) Play back the SR2-1/P (00:00 to 15:00).

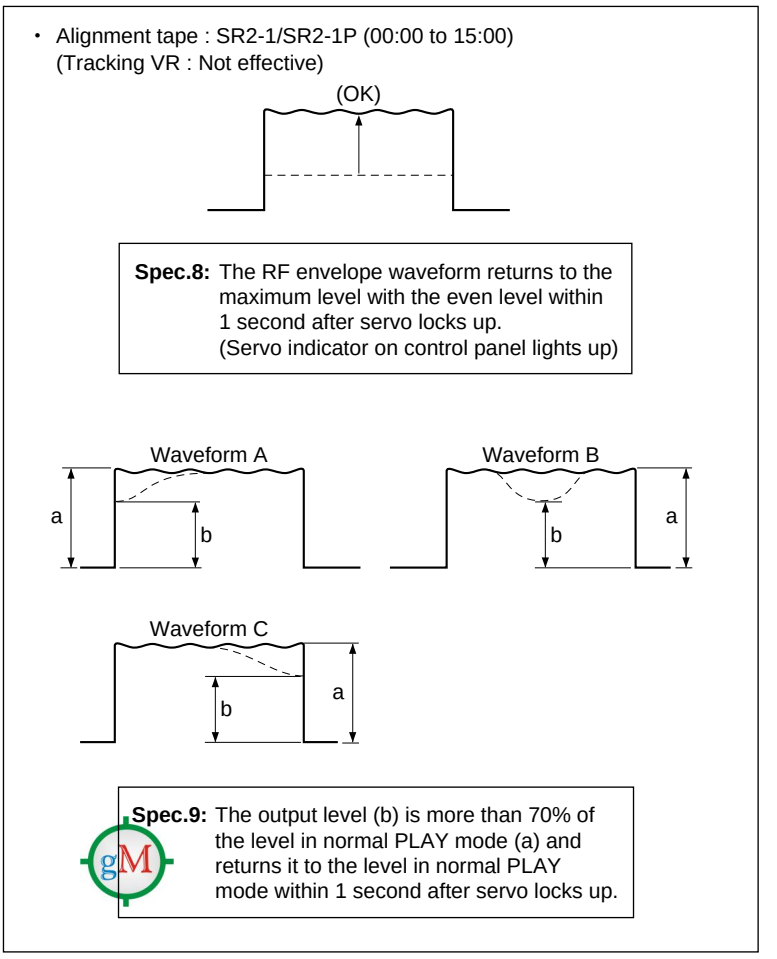
(2) Put the unit into the REW mode once. Two or three seconds later, put the unit into the PLAY mode.

Check that the RF envelope waveform satisfies the specification 8.

- In case of the waveform become A, B or C
  Check that the output level (b) is more than 70% of the level in normal PLAY mode (a) and returns it to the level in normal PLAY mode within 1 second after servo locks up. (Spec. 9)

  If specification 9 is not satisfied in waveform A or B shown in the figure, check the tape running at the tape approaching side. (Refer to Section 7-1-2.)

  If specification 9 is not satisfied in waveform C shown in the figure, check the tape running at the tape leaving side. (Refer to Section 7-1-2.)


• Alignment tape : SR2-1/SR2-1P (00:00 to 15:00)
(Tracking VR : Not effective)
(OK)
Spec.8: The RF envelope waveform returns to the maximum level with the even level within 1 second after servo locks up.
(Servo indicator on control panel lights up)
Waveform A
a
b
Waveform B
b
a
Waveform C
b
a
Spec.9: The output level (b) is more than 70% of the level in normal PLAY mode (a) and returns it to the level in normal PLAY mode within 1 second after servo locks up.

Video Tracking Check (REW ⇨ PLAY)

Adjustment

Drum Entrance Side

12. Change the Mode Setting

(1) Press the SET button to cancel the SWITCHING PB mode.
(2) Turn the search dial while pressing the JOG button so that the "FULL PB" is indicated, and press the SET button.

Note

After that, the overlap portion appears on the RF waveform.

13. Adjust the Tracking at Drum Entrance Side

(1) Play back the SR2-1/P (00:00 to 15:00).
(2) Push S100 switch on the SS-63 board more than 1 sec. so that the tracking VR becomes to be effective.
(3) Turn RV100 on the SS-63 board clockwise and adjust the center portion of the RF envelope waveform makes 80% of the maximum output level.
(4) Loosen the upper flange of TG-2, and turn the upper flange so that the tape does not in contact with the upper flange of TG-2.
(5) Turn the height adjustment nut of TG-1 so that the overlap portion of the entrance side of the RF envelope waveform makes flat. (Fig. 1)

If the waveform does not make flat, perform the check described below.

① Clean the drum lead with a bamboo stick. (Refer to Section 5-2-4 of Maintenance Manual Part 1.)
② Press down the tape by bamboo stick very lightly and check that the tape is running along the drum lead.

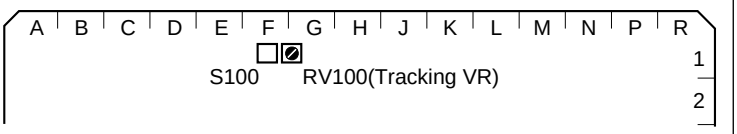
(6) Turn the height adjustment nut of TG-1 clockwise 30° more from the state of the step (5).

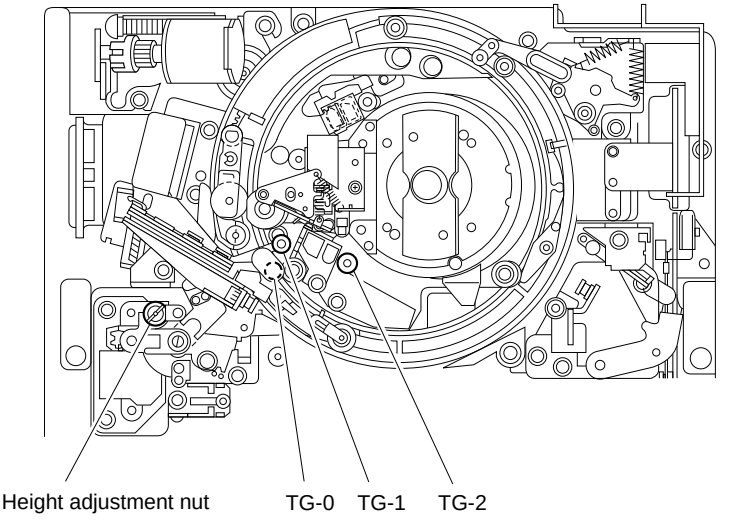
Note

Turning the height adjustment nut causes the waveform of the overlap portion to be not flat.

(7) Turn the upper flange of TG-2 to clockwise so that the upper flange contacts the tape.

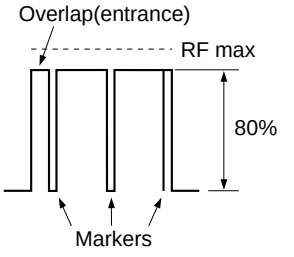
<SS-63 board, side A>

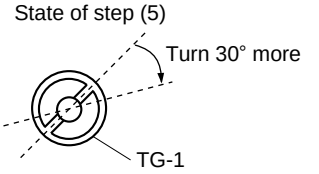




・ Alignment tape : SR2-1/SR2-1P (00:00 to 15:00)
(Tracking VR : Effective)

<Fig. 1>





– Continued on the next page. –

(8) Check that the levels A and B as shown in the figure satisfy the specification 10.

If the waveform is not satisfied the specification 10, perform the adjustment from step (1) again.

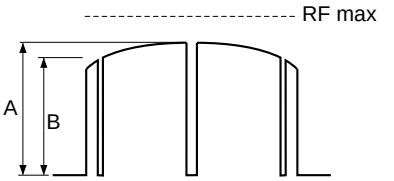
(9) Check the tape running at the drum entrance side in the following modes.
- PLAY mode
- F. FWD mode
- REW mode
- REV × 1 mode
- VAR × −1/30 mode

If the tape curl does not satisfy the specification 11 at either TG-0, TG-1 or TG-2, perform the adjustments from the step (1) again.

14. Recheck the Video Tracking

Perform steps 5 through 11 again.

<Fig. 2>



A = RF max × 0.8

Spec.10: $\frac{B}{A} \times 100 \geqq 70\%$

<Tape running check at entrance side>

Spec. 11: ① TG-0
The tape runs without any curl at the upper and lower flanges.

② TG-1 (S Tension regulator)
The tape runs in contact with the upper flange.
The tape curl is less than 1/10 of the tape width.

③ TG-2 (Entrance guide)
The tape runs in contact with the upper flange.
The tape curl is less than 1/10 of the tape width.

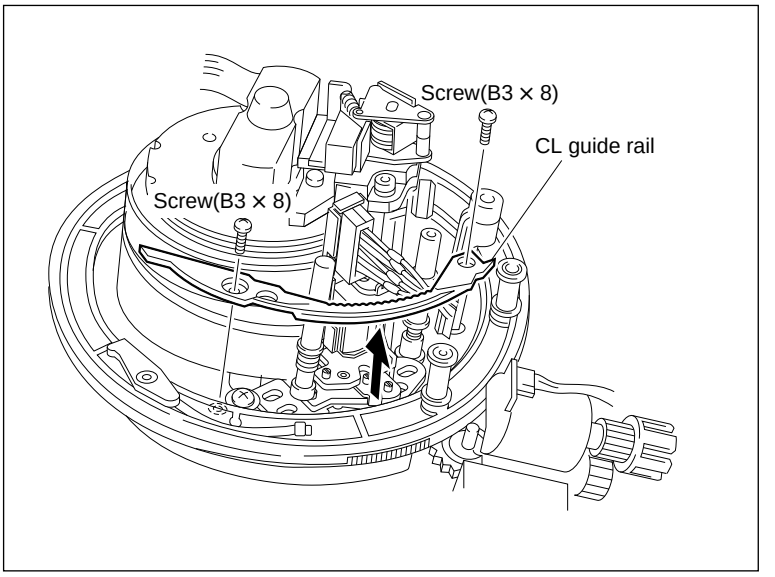
④ Lead of drum entrance side
The tape runs in contact with the drum lead and without any curl at the lead.

Tracking Adjustment at Drum Entrance Side

Drum Exit Side

15. CL Guide Rail Removal

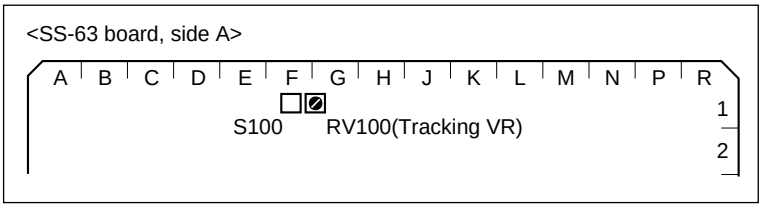
Remove the two screws, then remove the CL guide rail.



CL Guide Rail Removal

16. Tracking Adjust at Drum Exit Side

(1) Play back the SR2-1/P (00:00 to 15:00).
(2) Push S100 switch on the SS-63 board more than 1 sec. so that the tracking VR becomes to be effective.
(3) Turn RV100 on the SS-63 board clockwise and adjust the center portion of the RF envelope waveform to the maximum output level.



– Continued on the next page. –

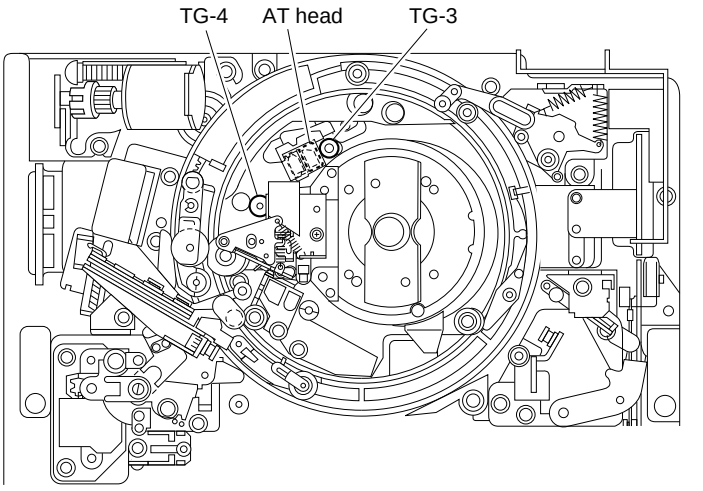
(4) Turn the height adjustment nut of TG-3 counterclockwise by one to two turns so that the tape does not in contact with the upper flange of TG-3.

(5) Turn the height adjustment nut of TG-4 clockwise so that the tape does not in contact with the lower flange of TG-4.

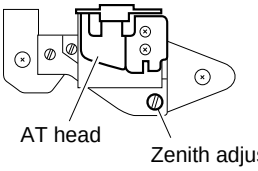
(6) Turn the zenith adjustment screw of the AT head so that the right portion of the RF envelope waveform makes 20% or less of the maximum output level. (Fig. 1)
At this time, check that the tape does not in contact with both upper flange of TG-3 and lower flange of TG-4.
If the tape contacts either flange, repeat step (4) or (5).
If the tape moves upward or downward following the height adjustment nut movement, perform the following adjustment.
This trouble cause is uneven tape tension at upside or downside of the tape caused by AT head zenith.
- If the tape moves upward at TG-3:
  Turn the zenith adjustment screw counterclockwise.
- If the tape moves downward at TG-4:
  Turn the zenith adjustment screw clockwise.

(7) Turn the height adjustment nut of TG-3 so that the tape is in contacts with the upper flange and the RF envelope waveform becomes flat. (Fig. 2)
At that time, the tape does not in contact with the lower flange of TG-4.

– Continued on the next page. –

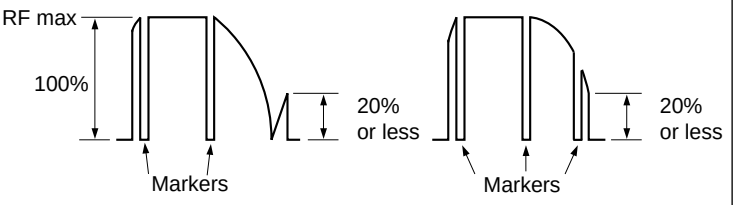


- Alignment tape : SR2-1/SR2-1P (00:00 to 15:00)

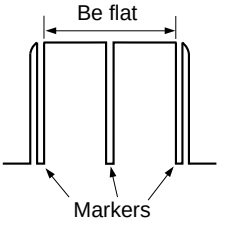


- Alignment tape : SR2-1/SR2-1P (00:00 to 15:00)
  (Tracking VR : Effective)

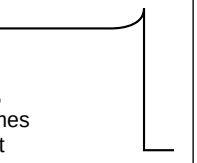
<Fig. 1>



<Fig. 2>



If the pressure against the tape at TG-3 is too much, the waveform becomes as shown in the right figure. (NG)



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If the waveform does not become flat, perform the check and adjustment below.

① Clean the drum lead with a bamboo stick. (Refer to Section 5-2-4 of Maintenance Manual Part 1.)

② Press down the tape by bamboo stick very lightly and check that the tape is running without aparting from the drum lead.

③ If the waveform does not become flat even though steps ① and ② mentioned above are performed, adjust the height of TG-3 so that the RF envelope waveform is nearly flat within the range of the specification 12 shown in the Fig.3. At this time, do not overpress the tape at TG-3.

Note

When adjusting the height of TG-3 in step ③, be sure to check the height of AT head (Refer to Section 7-1-6). If the AT head height does not satisfy the specification, repeat the video tracking adjustment.

(8) Adjust the height of TG-4 so that the lower flange of TG-4 in contact with the tape.

(9) Check the tape running at the drum exit side in the following modes.
- PLAY mode
- F. FWD mode
- REW mode
- REV × 1 mode
- VAR × −1/30 mode

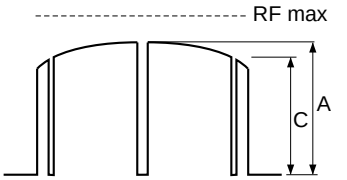
If the tape curl does not satisfy the specification 13 at TG-3, perform the following adjustments while observing the waveform.

① Change the zenith of the AT head within the range of the specification shown in Fig. 1.

② Perform the tracking adjustment again. (Refer to steps (1) through (9) mentioned above.)

③ (In case of the adjustment is performed the AT head zenith)
Perform the checks and adjustments described below.
- AT head height (Refer to Section 7-1-6.)
- AT head azimuth (Refer to Section 7-1-7.)
- AT head head-to-tape contact (Refer to Section 7-1-8.)
- AT head position (Refer to Section 7-1-9.)

<Fig. 3>



A = RF max × 0.8

Spec.12: $\frac{C}{A} \times 100 \geqq 70\%$

<Tape-running check>

Spec.13 :
⑤ Lead of drum exit side
The tape runs without any curl at the lead.

⑥ TG-3 (Exit guide)
The tape runs in contact with the upper flange.
The tape curl is less than 1/10 of the tape width.

⑦ TG-4
The tape runs in contact with the lower flange.
The tape curl is less than 1/10 of the tape width.

⑧ TG-5 (Threading roller)
The tape runs without any curl at the upper and lower flanges.

Tracking Adjustment at Drum Exit Side

17. Recheck the Video Tracking

Perform the steps 5 through 11 again.

18. Attach the CL Guide Rail

Attach the CL guide rail with two screws. (Refer to step 15.)

7-1-4. CTL Head Height Check and Adjustment

Tools

- Alignment tape SR2-1 (For 525/60 system): 8-960-075-11
- Alignment tape SR2-1P (For 625/50 system): 8-960-075-61
- Oscilloscope (Tektronix 2465B or equivalent)
- Tape guide adjustment driver (MW-261): J-6322-610-A

Preparation

1. Turn the Power Off

2. Connect the Oscilloscope

CH-1 : TP321/SS-63 board (CTL signal)
TRIG : TP325/SS-63 board (SS GOP signal)
Oscilloscope setting :
CH-1 : 2 V/DIV
TIME : 5 ms/DIV

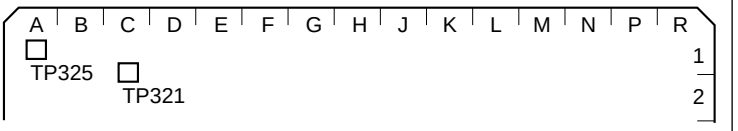
3. Set the Alignment Tape

Set the SR2-1/P and put a weight on the cassette so that it does not rise up.
Weight about 1000 g is suitable.

- Connection of the oscilloscope

CH-1: TP321/SS-63 board (CTL SIG signal)
TRIG: TP325/SS-63 board (SS GOP signal)

<SS-63 board, side A>



Preparation

Check

4. Turn the Power On

5. Play Back the Alignment Tape

Play back the SR2-1/P (15:00 to 27:00).

6. Check the CTL Head Height

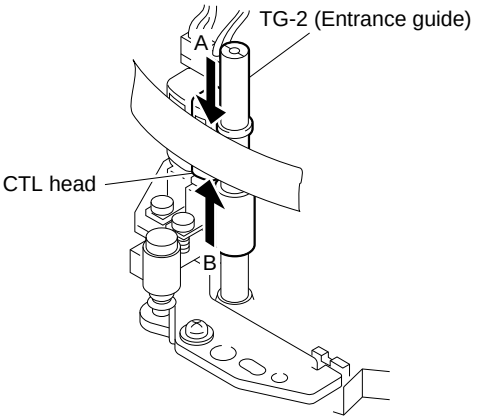
(1) Check that the level decreases when portion A of the tape shown in the figure is pressed down.

If the level increases, perform step 7.

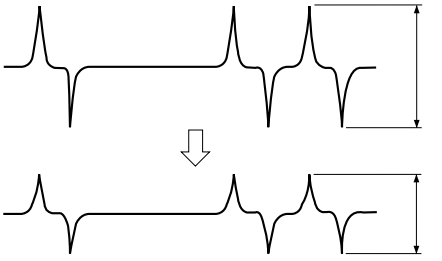
(2) Check that the level decreases when portion B of the tape is pushed up.

If the level increases, perform step 8.

- Alignment tape : SR2-1/SR2-1P (15:00 to 27:00)



<CTL output waveform>



Spec.: The level decreases when pressing down and pushing up the alignment tape.

CTL Head Height Check

Adjustment

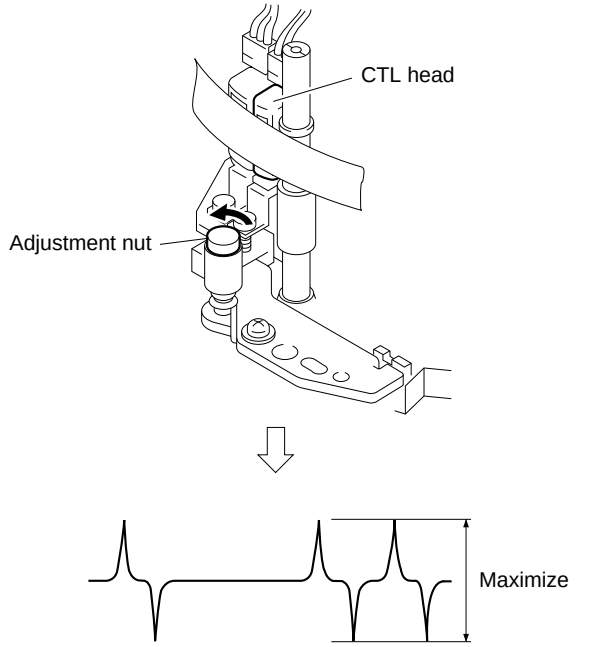
7. In Case the Level Increases when the Tape is Pressed Down (Fig. 1)

Turn the adjustment nut counterclockwise and adjust so that the output waveform is maximum.

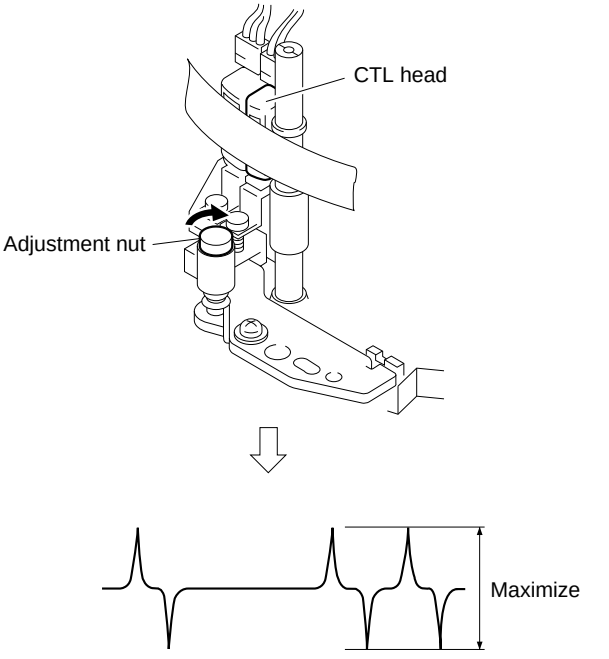
8. In Case the Level Increases when the Tape is Pushed Up (Fig. 2)

Turn the adjustment nut clockwise and adjust so that the output waveform is maximum.

<Fig. 1>



<Fig. 2>



CTL Head Height Adjustment

7-1-5. CTL Head Position Check and Adjustment

Note

The CTL head position adjustment is closely related to the AT head position adjustment.
Be sure to confirm the AT head position when the CTL head position is adjusted.

Tools

- Alignment tape SR2-1 (For 525/60 system): 8-960-075-11
- Alignment tape SR2-1P (For 625/50 system): 8-960-075-61
- Oscilloscope (Tektronix 2465B or equivalent)

Preparation

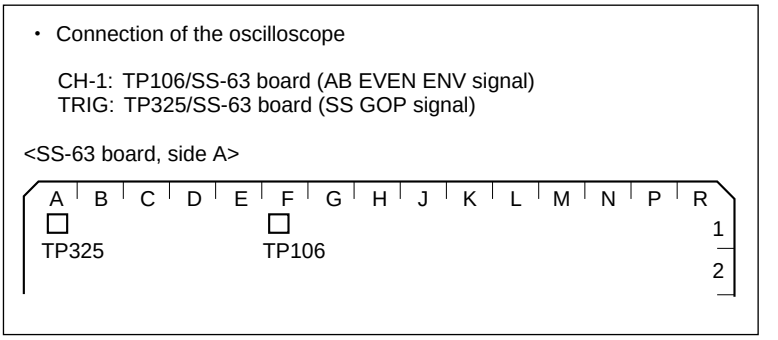
1. Turn the Power Off

2. Connect the Oscilloscope

CH-1: TP106/SS-63 board (AB EVEN ENV signal)
TRIG: TP325/SS-63 board (SS GOP signal)
Oscilloscope setting :
CH-1 : 1 V to 200 mV/DIV
TRIG : 5 V/DIV
TIME : 5 ms/DIV

3. Set the Alignment Tape

Set the SR2-1/P and put a weight on the cassette so that it does not rise up.
Weight about 1000 g is suitable.



Preparation

Check

4. Turn the Power On

5. Mode Setting (REC Head PB)

(1) Press S1101 switch on the SS-63 board to enter the maintenance mode.
(2) Set the cursor "∗" to the "M0 : TAPE MAINTENANCE" and press the SET button.
(3) Set the cursor to the "C4 : OTHERS" and press the SET button.
(4) Set the cursor to the "C48 : PATH MODE SEL" and press the SET button.
(5) Check that the "Switching PB" is indicated, and press the SET button.

Note

Refer to Section 4 of the maintenance manual part 1 "Maintenance Mode" for more information about the maintenance mode.

6. Play Back the Alignment Tape

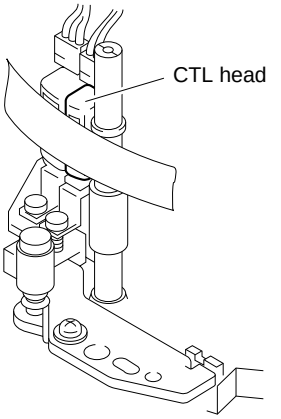
Play back the SR2-1/P (00:00 to 15:00).

7. Check the CTL Head Position

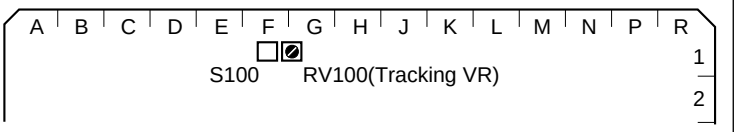
(1) Check that the marker exists in the RF waveform that comes 15 ms. later than the rising edge of the SS GOP signal.
(2) Push S100 switch on the SS-63 board more than 1 sec. so that the tracking VR becomes to be effective.
(3) Turn RV100 (tracking VR) on the SS-63 board so that the output level at the center portion of the RF envelope waveform is maximum and read the maximum level as Lv.
(4) Push S100 switch on the SS-63 board more than 1 sec. to fix the tracking VR.
(5) Read the output level at the center portion of the RF envelope waveform as L_F.
(6) Check that the levels Lv and L_F satisfy the specification 2.

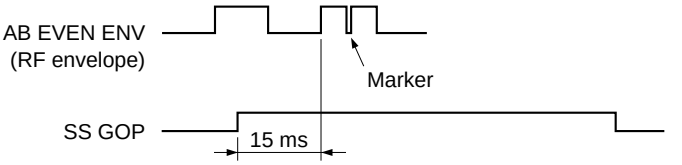
If the specification is not satisfied, perform steps 8 and later.

• Alignment tape : SR2-1/SR2-1P (00:00 to 15:00)
(Tracking VR : Effective)



<SS-63 board, side A>





Spec.1: The marker exists in the RF waveform that comes 15 ms later than the rising edge of the SS GOP signal.

(Tracking control : Effective state) (Tracking control : Non effective state)

$$\frac{L_F}{L_V} \geqq 0.8$$

Spec.2: When the tracking VR is not effective, the output level at the center portion of the RF envelope waveform (L_F) is 80% and more against the maximum output level (L_V) under the state of the tracking is effective.

CTL Head Position Check

Adjustment

Note

Perform the adjustment described below under the state of the tracking is not effective.

8. Loosen the Screw

Loosen the securing screw of the CTL/FE head assembly by 1/4 to 1/2 turn.

9. Adjust the CTL Head Position

(1) Insert a 3 mm flatbladed screwdriver into the notch of the CTL/FE head assembly.
(2) Adjust the CTL/FE head assembly position so that the output level at the center portion is maximum and the marker exists in the RF envelope waveform that comes 15 ms later than the rising edge of the SS GOP signal.

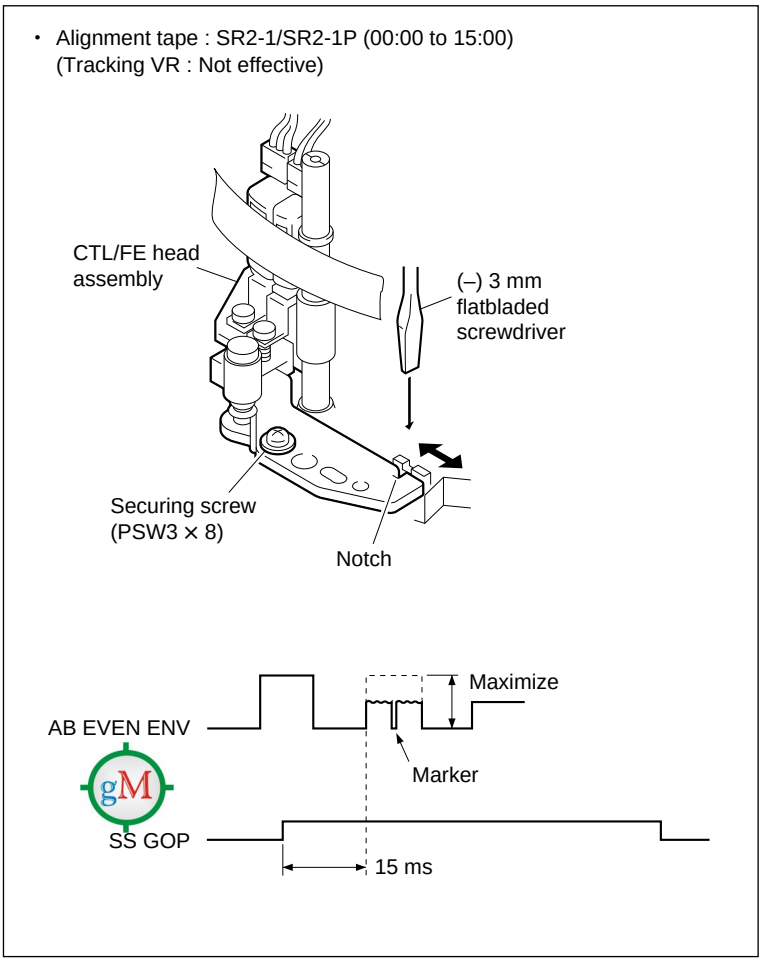
10. Tighten the Screw

Tighten the screw loosened in step 8.

Tightening torque: 98×10^{-2} N • m
{10.0 kgf • cm}

11. Recheck the CTL Head Position

Perform to steps 5 through 7 again.



CTL Head Position Adjustment

In Case the Adjustment is Performed

12. Adjust the AT Head Position

Refer to Section 7-1-9.

13. Locking Compound Applying

Refer to Section 7-1.

7-1-6. AT Head Height Check and Adjustment

Note

The AT head height adjustment is closely related to the azimuth adjustment, head-to-tape contact adjustment, and head position adjustment.
Be sure to perform adjustments (or checks) according to “In Case the Adjustment is Performed” in this section when the AT head height is adjusted.

Tools

- Alignment tape CR8-1A (For DNW-A100/A50/A45): 8-960-097-45
- Alignment tape CR8-1A PS (For DNW-A100P/A50P/A45P): 8-960-098-45
- Oscilloscope (Tektronix 2465B or equivalent)

Preparation

1. Turn the Power Off

2. Connect the Oscilloscope

CH-1 : TP500/APR-12 board (1.PB.L signal)
Ground at E500
CH-2 : TP600/APR-12 board (2.PB.L signal)
Ground at E600
Oscilloscope setting :
CH-1 : 200 mV/DIV
CH-2 : 200 mV/DIV
TIME : 5 ms/DIV

Note

“1.PB.L” signal (TP500) is the playback signal of the CH-1 of the AT head.
“2.PB.L” signal (TP600) is the playback signal of the CH-2 of the AT head.

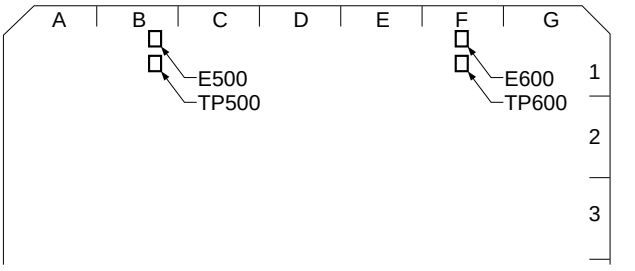
3. Set the Alignment Tape

Set the CR8-1A/PS and put a weight on the cassette so that it does not rise up.
Weight about 1000 g is suitable.

- Connection of th oscilloscope

CH-1: TP500/APR-12 board (1.PB.L signal)
CH-2: TP600/APR-12 board (2.PB.L signal)

<APR-12 board, side A>



Preparation

Check

4. Turn the Power On

5. Play Back the Alignment Tape

Play back the 1 kHz, 0 VU signal portion (8:00 to 10:00) on the CR8-1A/PS.

6. Check the AT Head Height

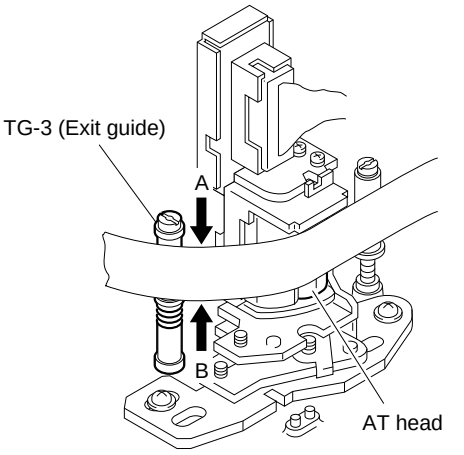
(1) Check that both levels in CH-1 and CH-2 decrease when portion A of the tape shown in the figure is pressed down.

If both levels increase, perform step 7.

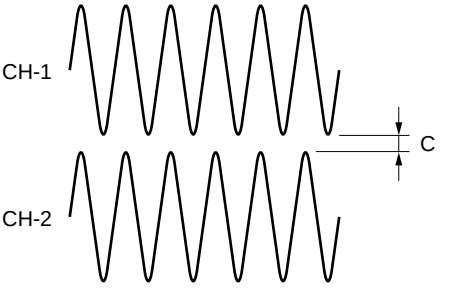
(2) Check that both levels in CH-1 and CH-2 decrease when portion B of the tape is pushed up.

If both levels increase, perform step 8.

• Alignment tape : CR8-1A/CR8-1A PS (8:00 to 10:00)



<Audio output waveform>



Spec. : The portion C widens when pressing down and pushing up the alignment tape.

AT Head Height Check

Adjustment

7. In Case both Levels Increase when the Tape is Pressed Down (Fig. 1)

Turn the height adjustment screw clockwise so that both output waveforms in CH-1 and CH-2 are maximum.

8. In Case both Levels Increase when the Tape is Pushed Up (Fig. 2)

(1) Turn the height adjustment screw counterclockwise so that both output waveforms in CH-1 and CH-2 are maximum. Turn the height adjustment screw counterclockwise more about 1/2 turn.
(2) Turn the height adjustment screw clockwise and adjust so that both output waveforms in CH-1 and CH-2 maximum.

Note

To stabilize the AT head height after the adjustment, set the maximum output level with the AT head moved from bottom to top (with the height adjustment screw turned clockwise).

In Case the Adjustment is Performed

9. Adjust the AT Head Azimuth

Refer to Section 7-1-7.

10. Adjust the AT Head Head-to-tape Contact

Refer to Section 7-1-8.

11. Adjust the AT Head Position

Refer to Section 7-1-9.

12. Recheck the AT Head Height

Refer to steps 5 and 6 in this section.

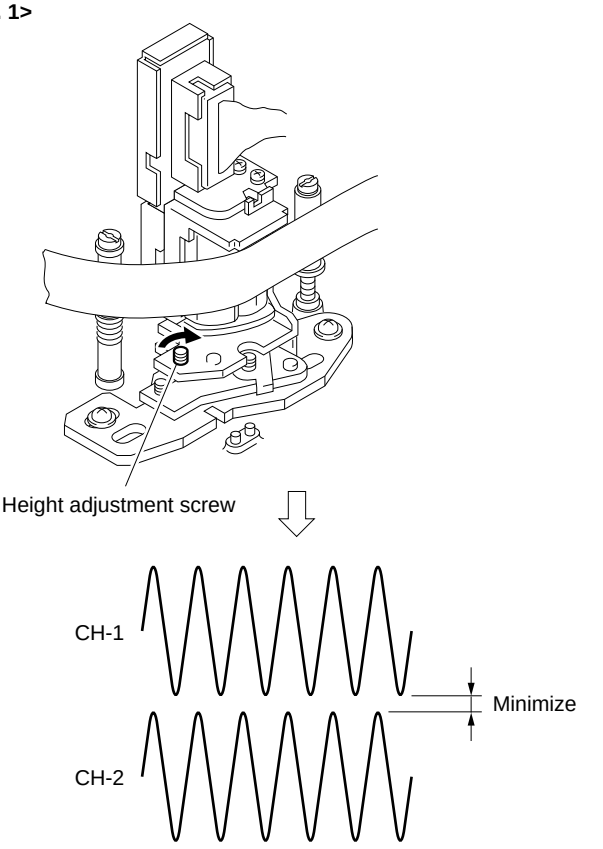
13. Re-check the AT Head

Perform the steps 9 through 11 again.

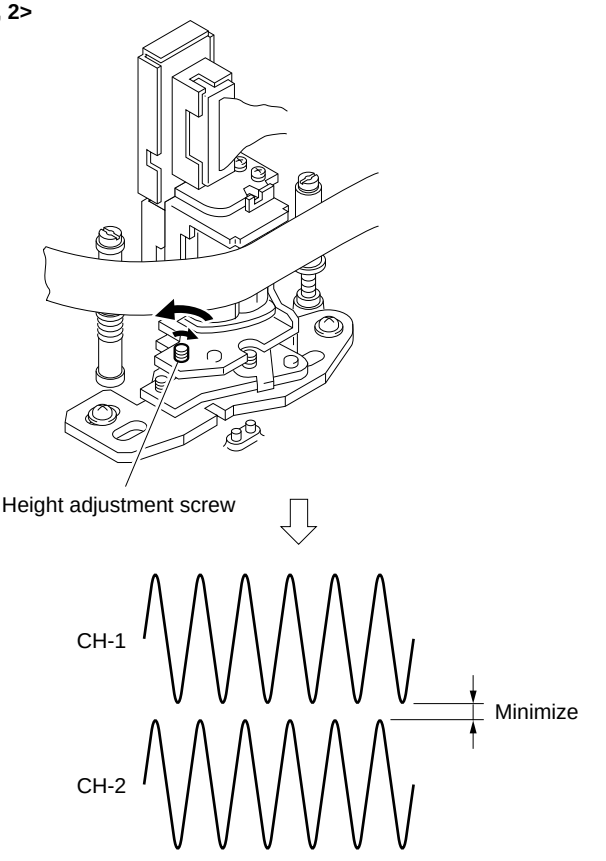
14. Locking Compound Applying

Refer to Section 7-1.

<Fig. 1>



<Fig, 2>



AT Head Height Adjustment

7-1-7. AT Head Azimuth Check and Adjustment

Note

The AT head azimuth adjustment is closely related to the head-to-tape contact adjustment, head position adjustment, and head height adjustment.
Be sure to perform adjustments (or checks) according to “In Case the Adjustment is Performed” in this section when the AT head azimuth is adjusted.

Tools

- Alignment tape CR8-1A (For DNW-A100/A50/A45): 8-960-097-45
- Alignment tape CR8-1A PS (For DNW-A100P/A50P/A45P): 8-960-098-45
- Oscilloscope (Tektronix 2465B or equivalent)

Preparation

1. Turn the Power Off

2. Connect the Oscilloscope

CH-1 : TP500/APR-12 board (1.PB.L signal)
Ground at E500
CH-2 : TP600/APR-12 board (2.PB.L signal)
Ground at E600
Oscilloscope setting :
CH-1 : 50 mV/DIV
CH-2 : 50 mV/DIV
MODE : X-Y

Note

“1.PB.L” signal (TP500) is the playback signal of the CH-1 of the AT head.
“2.PB.L” signal (TP600) is the playback signal of the CH-2 of the AT head.

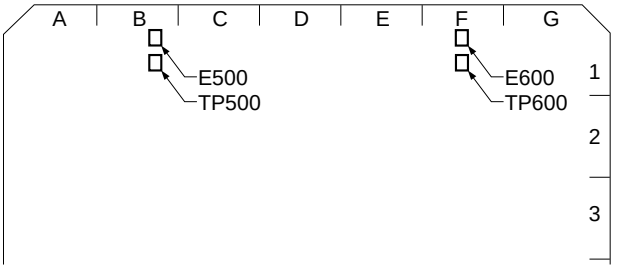
3. Set the Alignment Tape

Set the CR8-1A/PS and put a weight on the cassette so that it does not rise up.
Weight about 1000 g is suitable.

- Connection of the oscilloscope

  CH-1: TP500/APR-12 board (1.PB.L signal)
  CH-2: TP600/APR-12 board (2.PB.L signal)

<APR-12 board, side A>



Preparation

http://getMANUAL.com

Check

4. Turn the Power On

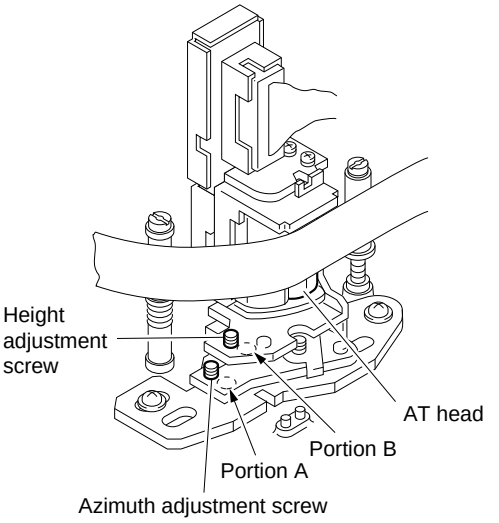
5. Play Back the Alignment Tape

Play back the 10 kHz, −10 VU signal portion (3:00 to 4:55) on the CR8-1A/PS.

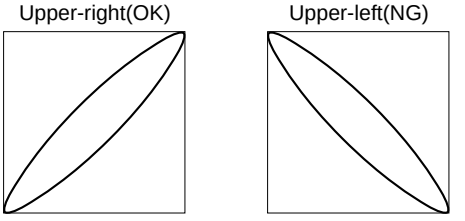
6. Check the AT Head Azimuth

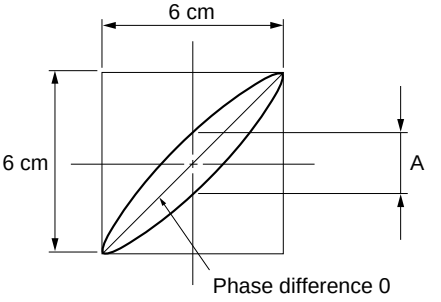
(1) Adjust the horizontal and vertical amplitudes of lissajous waveform to 6 cm each.
(2) Check that the lissajous waveform holds the upper-right shape.
(3) Check that the vertical amplitude at the center point in the horizontal direction satisfies the specification.
(4) Strike the portions A and B shown in the figure lightly with the tip of a screwdriver. Then check that the specification is satisfied.
(5) If the specification in any of steps (1), (2) or (3) is not satisfied, perform steps 7 and later.

• Alignment tape : CR8-1A/CR8-1A PS (3:00 to 4:55)



<Lissajous waveform>





Spec. : A ≦ 0.52 cm

AT Head Azimuth Check

Adjustment

7. Adjust the AT Head Azimuth

(1) Turn the azimuth adjustment screw so that the specification is satisfied.

(2) Strike the portions A and B shown in the figure lightly with the tip of a screwdriver. Then check that the specification is satisfied.

In Case the Adjustment is Performed

8. Adjust the AT Head Head-to-tape Contact

Refer to Section 7-1-8.

9. Adjust the AT Head Position

Refer to Section 7-1-9.

10. Check the AT Head Height

Refer to Section 7-1-6.

11. Check the AT Head Azimuth

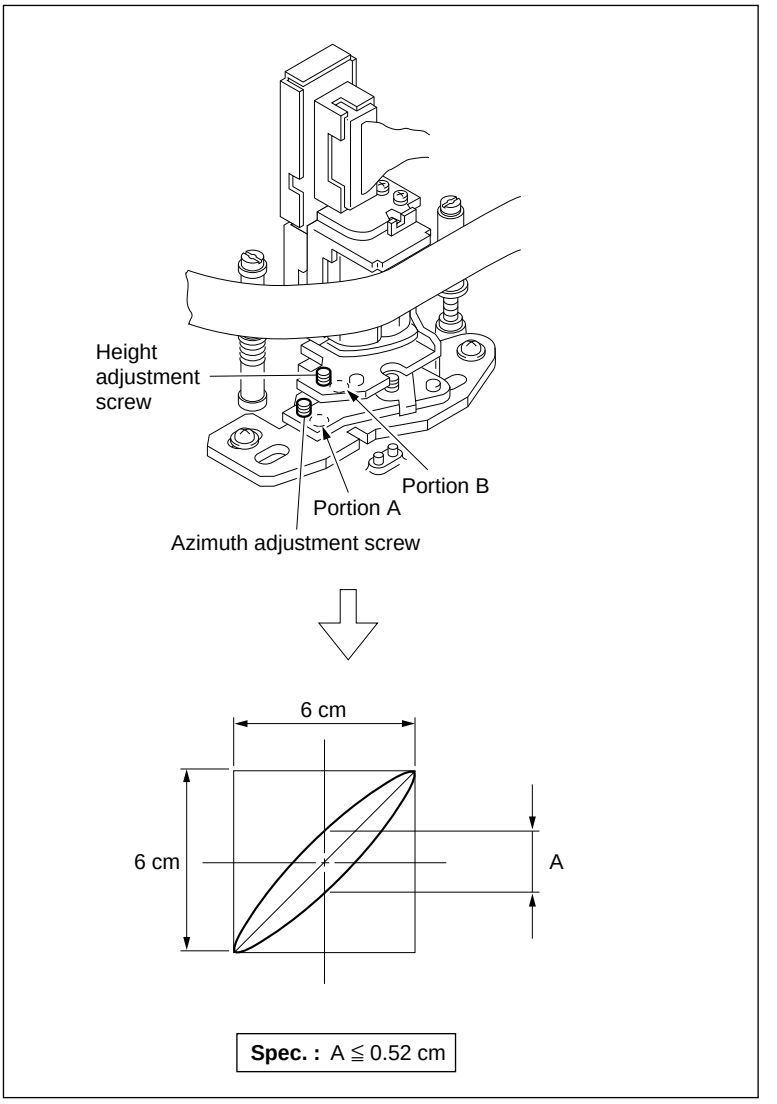
Refer to steps 5 and 6 in this section.

12. Re-check the AT head

Rerform the steps 8 through 10 again.

13. Locking Compound Applying

Refer to Section 7-1.



AT Head Azimuth Adjustment

7-1-8. AT Head Head-to-tape Contact Check and Adjustment

Note

The AT head head-to-tape contact adjustment is closely related to the head position adjustment, head height adjustment, and head azimuth adjustment.
Be sure to perform adjustments (or checks) according to “In case the adjustment is performed” in this section when the AT head head-to-tape contact is adjusted.

Tools

- Alignment tape CR8-1A (For DNW-A100/A50/A45): 8-960-097-45
- Alignment tape CR8-1A PS (For DNW-A100P/A50P/A45P): 8-960-098-45
- Oscilloscope (Tektronix 2465B or equivalent)
- Torque screwdriver (6 kgf•cm) (JB-5251): J-6252-510-A
- Torque screwdriver’s bit (+2 mm, l= 75 mm): J-6323-420-A

Preparation

1. Turn the Power Off

2. Connect the Oscilloscope

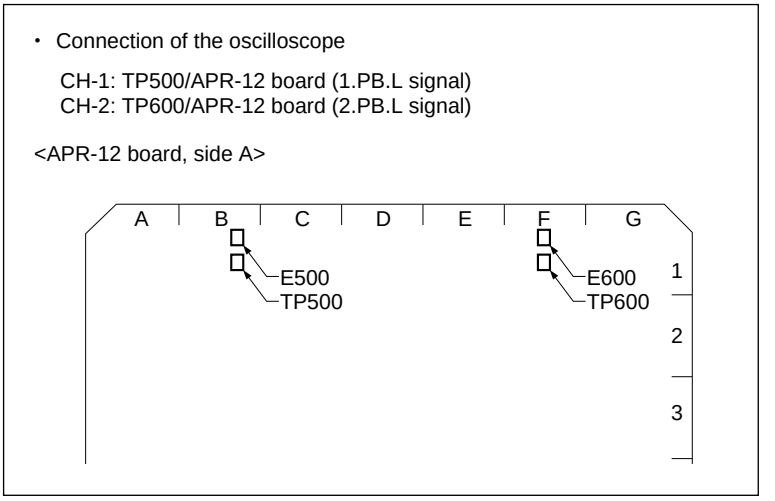
CH-1 : TP500/APR-12 board (1.PB.L signal)
Ground at E500
CH-2 : TP600/APR-12 board (2.PB.L signal)
Ground at E600
Oscilloscope setting :
CH-1 : 200 mV/DIV
CH-2 : 200 mV/DIV
TIME : 1 ms/DIV

Note

“1.PB.L” signal (TP500) is the playback signal of the CH-1 of the AT head.
“2.PB.L” signal (TP600) is the playback signal of the CH-2 of the AT head.

3. Set the Alignment Tape

Set the CR8-1A/PS and put a weight on the cassette so that it does not rise up.
Weight about 1000 g is suitable.



Preparation

Check

4. Turn the Power On

5. Play Back the Alignment Tape

Play back the 10 kHz, −10 VU signal portion (3:00 to 4:55) on the CR8-1A/PS.

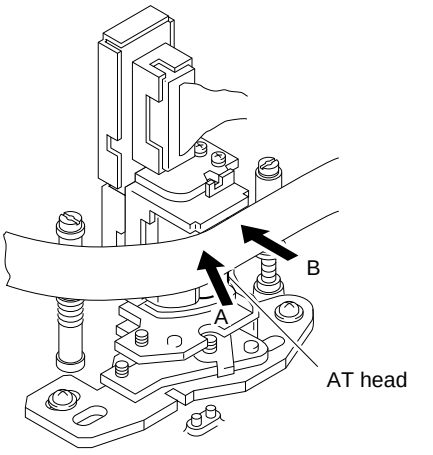
6. Check the AT Head Head-to-tape Contact

(1) Push portions A and B of the tape shown in the figure slightly. (It means increasing the tape's wrapping angle against the AT head.)

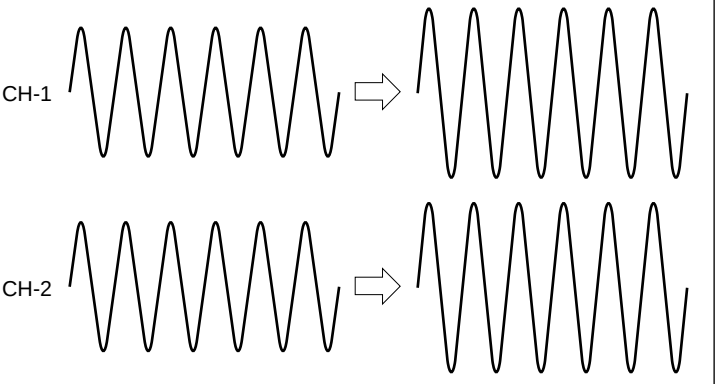
(2) Check that both increasing values of the output levels in CH-1 and CH-2 satisfy the specification.

If the specification is not satisfied, perform steps 7 and later.

• Alignment tape : CR8-1A/CR8-1A PS (3:00 to 4:55)



<AUDIO output waveform>



Spec. : Both increasing values of the output levels in CH-1 and CH-2 are within 5%.

AT Head Head-to-tape Contact Check

Adjustment

7. Loosen the Screws

Loosen the two head securing screws by 1/4 to 1/2 turn.

8. Adjust the AT Head Head-to-tape Contact

(1) Insert a 2 mm flatbladed screwdriver into the notch of the adjustment plate.
(2) Adjust the AT head position so that the output waveform is maximum.

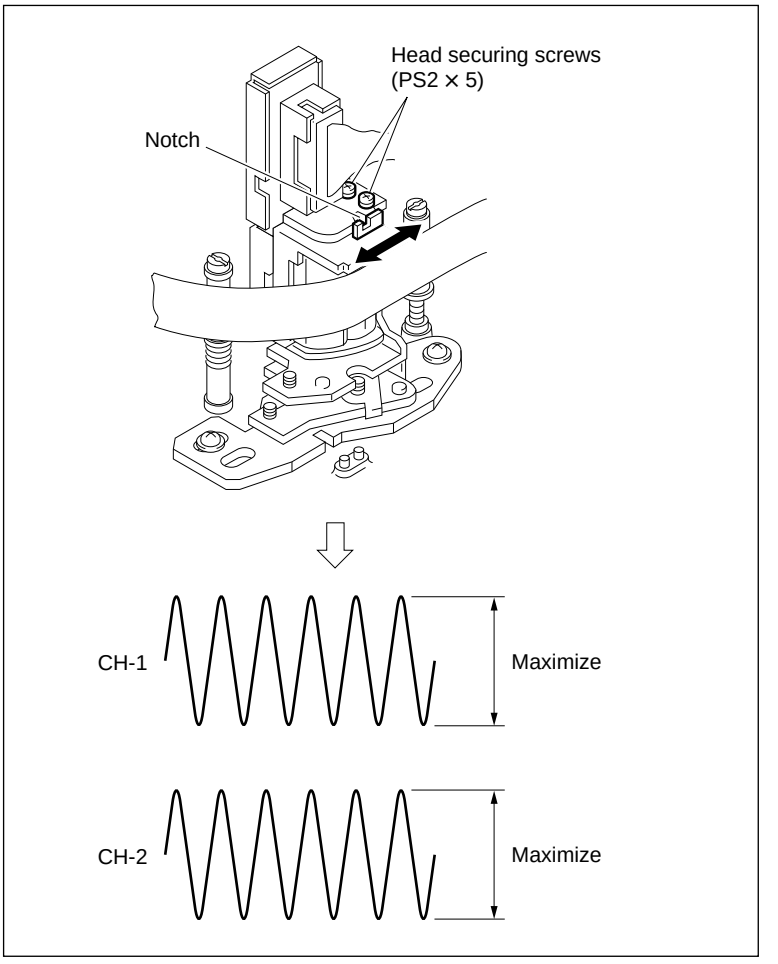
9. Tighten the Screws

Tighten the two securing screws loosened in step 7.

Tightening torque: 19.6×10^{-2} N • m
{2 kgf • cm}

10. Recheck the AT Head Head-to-tape Contact

Refer to steps 5 and 6 in this section.



AT Head Head-to-tape Contact Adjustment

In case the adjustment is performed

11. Check the AT Head Position

Refer to Section 7-1-9.

12. Check the AT Head Height

Refer to Section 7-1-6.

13. Check the AT Head Azimuth

Refer to Section 7-1-7.

7-1-9. AT Head Position Check and Adjustment

Notes

- The CTL head position adjustment should be completed before performing this adjustment. The AT head position is adjusted with the CTL head position as reference.
- The AT head position adjustment is closely related to the head height adjustment, head azimuth adjustment, and head-to-tape contact adjustment.
  Be sure to perform adjustments (or checks) according to “In Case the Adjustment is Performed” in this section when the AT head position is adjusted.

Tools

- Alignment tape SR2-1 (For 525/60 system): 8-960-075-11
- Alignment tape SR2-1P (For 625/50 system): 8-960-075-61
- Oscilloscope (Tektronix 2465B or equivalent)

Preparation

1. Turn the Power Off

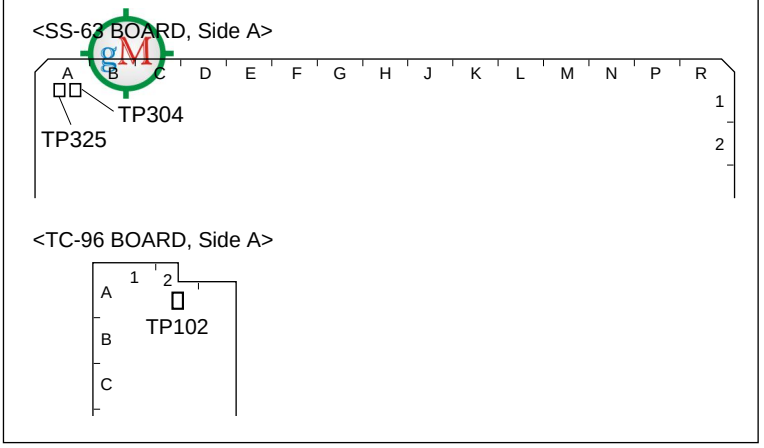
2. Connect the Oscilloscope

CH-1 : TP304/SS-63 board (CTL PULSE signal)
CH-2 : TP102/TC-96 board (PB LTC signal)
TRIG : TP325/SS-63 board (SS GOP signal)
Oscilloscope setting :
CH-1 : 200 mV/DIV
CH-2 : 200 mV/DIV
TIME : 5 ms to 500 µs/DIV

3. Set the Alignment Tape

Set the SR2-1/P and put a weight on the cassette so that it does not rise up.
Weight about 1000 g is suitable.

- Connection of the oscilloscope
  CH-1:TP304/SS-63 board (CTL PULSE Signal)
  CH-2:TP102/TC-96 board (PB LTC Signal)
  TRIG:TP325/SS-63 board (SS GOP Signal)



Preparation

Check

4. Turn the Power On

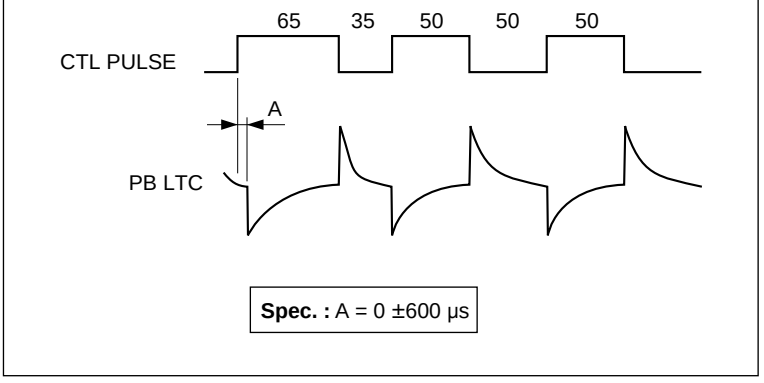
5. Play Back the Alignment Tape

Play back the SR2-1/P (00:00 to 15:00).

6. Check the AT Head Position

Check that the positional relationship between the rising edges of CTL's 65:35 pulse and PB LTC's 65:35 waveform signals satisfies the specification.
If the specification is not satisfied, perform steps 7 and later.

- Alignment Tape: SR2-1/SR2-1P (00:00 to 15:00)



AT Head Position Check

Adjustment

7. Remove the CL Guide Rail
Remove the two screws, then remove the CL guide rail.

8. Loosen the Screws
Loosen the two securing screws of the AT head assembly by 1/4 to 1/2 turn.

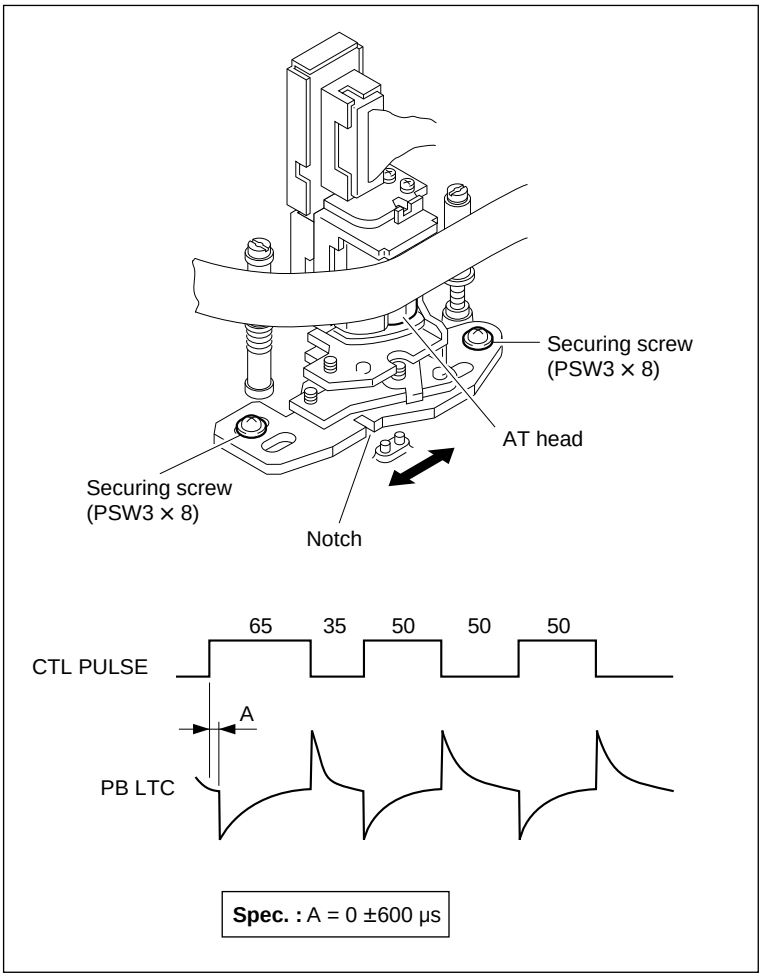
9. Adjust the AT Head Position
(1) Insert a 3 mm flatbladed screwdriver into the notch of the AT head assembly.
(2) Adjust the AT head assembly position so that the specification is satisfied.

10. Tighten the Screws
Tighten the two screws loosened in step 8.

Tightening torque: 98×10^{-2} N • m
{10.0 kgf • cm}

11. Recheck the AT Head Position
Refer to steps 5 and 6 in this section.

12. Attach the CL Guide Rail
Attach the CL guide rail with two screws.



AT Head Position Adjustment

In Case the Adjustment is Performed

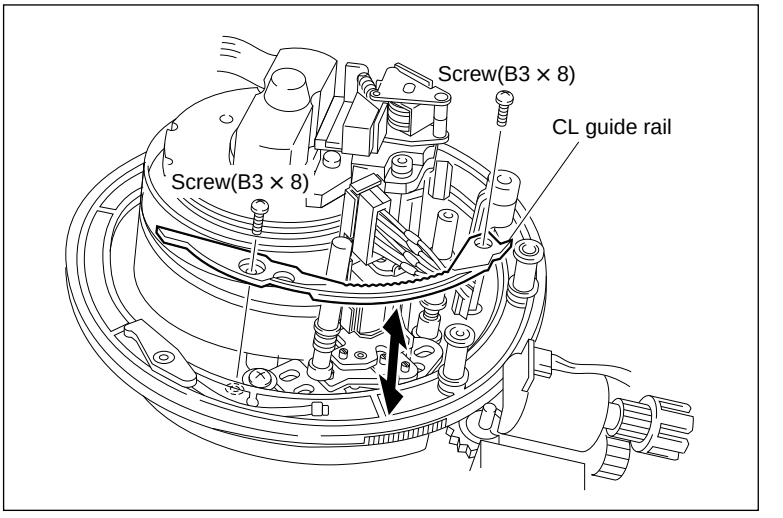
13. Check the AT Head Height
Refer to Section 7-1-6.

14. Check the AT Head Azimuth
Refer to Section 7-1-7.

15. Check the AT Head Head-to-tape Contact
Refer to Section 7-1-8.

16. Check the AT Head Position
Refer to steps 5 and 6 in this section.

17. Locking Compound Applying
Refer to Section 7-1.



Remove/Attach the CL Guide Rail

7-1-10. Audio Level Check and Adjustment in REV Mode

Tools

- Alignment tape CR8-1A (For DNW-A100/A50/A45): 8-960-097-45
- Alignment tape CR8-1A PS (For DNW-A100P/A50P/A45P): 8-960-098-45
- Oscilloscope (Tektronix 2465B or equivalent)
- Betacam cassette (S cassette): BCT-30MA
- Adjustment mirror (circular): J-6080-029-A
- Tape guide adjustment driver (MW-261): J-6322-610-A

Preparation

1. Turn the Power Off

2. Connect the Oscilloscope

CH-1 : TP500/APR-12 board (1.PB.L signal)
Ground at E500
CH-2 : TP600/APR-12 board (2. PB.L signal)
Ground at E600
Oscilloscope setting :
CH-1 : 200 mV/DIV
CH-2 : 200 mV/DIV
TIME : 5 ms/DIV

Note

"1.PB.L" signal (TP500) is the playback signal of the CH-1 of the AT head.
"2.PB.L" signal (TP600) is the playback signal of the CH-2 of the AT head.

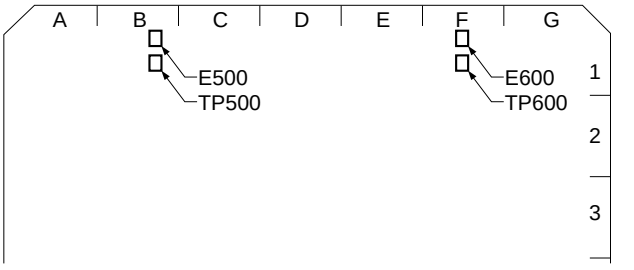
3. Set the Alignment Tape

Set the CR8-1A/PS and put a weight on the cassette so that it does not rise up.
Weight about 1000 g is suitable.

- Connection of the oscilloscope

CH-1: TP500/APR-12 board (1.PB.L signal)
CH-2: TP600/APR-12 board (2.PB.L signal)

<APR-12 board, side A>



Preparation

Check

4. Turn the Power On

5. Play Back the Alignment Tape

Play back the 1 kHz, 0 VU signal portion (8:00 to 10:00) on the CR8-1A/PS.

6. Check the Audio Output Level

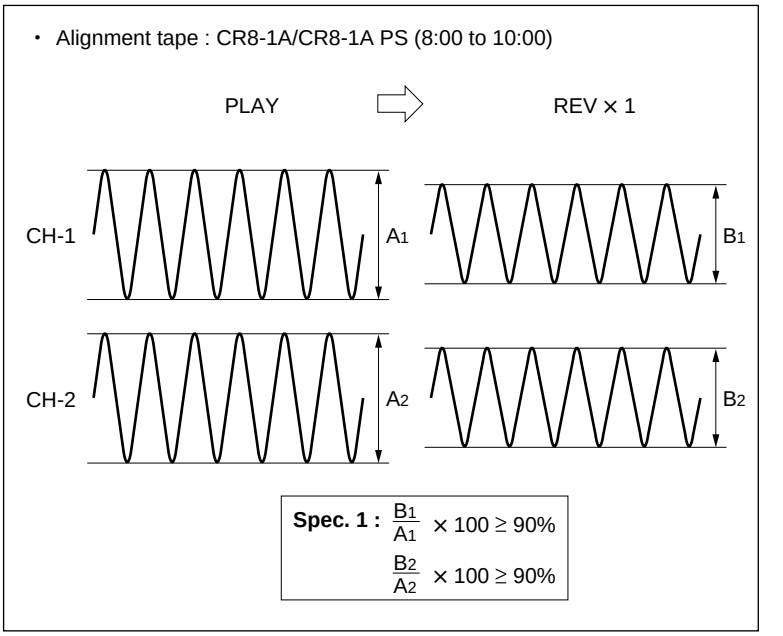
(1) Check the audio output level A_1 in CH-1.
(2) Check the audio output level A_2 in CH-2.

7. Put the Unit into the REV × 1 Mode

8. Check the Audio Output Level

(1) Check that the audio output level B_1 in CH-1 satisfies specification 1.
(2) Check that the audio output level B_2 in CH-2 satisfies specification 1.

If specification 1 is not satisfied, perform steps 9 and later.



Audio Level Check in REV Mode

Adjustment

9. Adjust the TG-5 (Threading Roller) Height

(1) Play back the 1 kHz, 0VU signal portion (8:00 to 10:00) on the CR8-1A/PS.
(2) Put the unit into the REV × 1 mode.
(3) In case the level increases when portion A of the tape shown in the figure is pressed down, turn the upper flange of TG-5 clockwise using a tape guide adjustment driver.
In case the level increases when portion B is pushed up, turn the upper flange of TG-5 counterclockwise.

Note

First, press the EJECT button to unthread the tape when turning the upper flange of TG-5.

(4) Check the audio output level satisfies specification 1. (Refer to steps 5 through 8.)

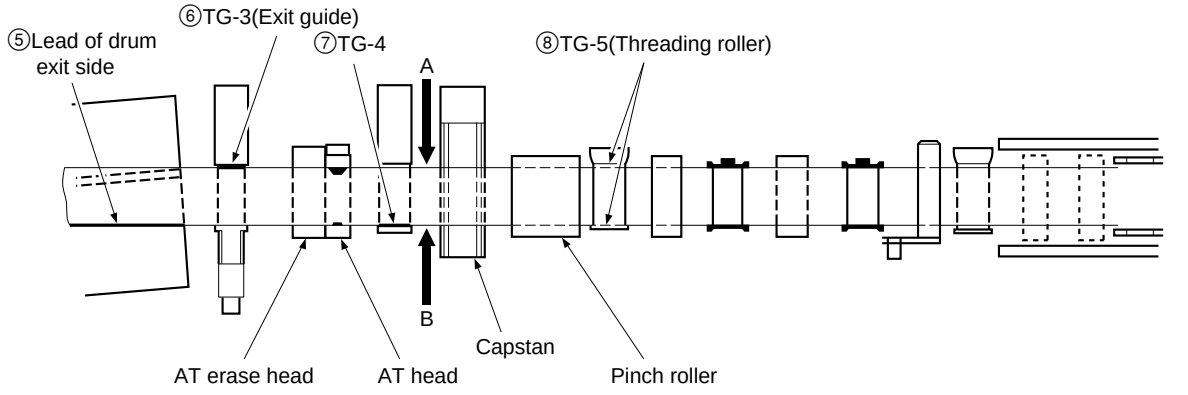
If the specification 1 is not satisfied, repeat steps (1) through (3) mentioned above.

10. Check the Tape Running at Drum Exit Side

In the modes below, check that the tape running condition satisfies specification 2.
(1) PLAY mode
(2) REV × 1 mode

If specification 2 is not satisfied, adjust the tape guides height at the drum exit side. (Refer to steps 12 through 14 (at the Drum Exit Side) in Section 7-1-2.)

If the height of the tape guide is adjusted, perform the video tracking check.
(Refer to Section 7-1-3.)



Spec.2: ⑤ Lead of drum exit side
The tape runs in contact with the drum lead and without any curl at the lead.
⑥
TG-3(Exit guide)
The tape runs in contact with the upper flange.
The tape curl is less than 1/10 of the tape width.
⑦
TG-4
The tape runs in contact with the lower flange.
The tape curl is less than 1/10 of the tape width.
⑧
TG-5(Threading roller)
The tape runs without any curl at the upper and lower flanges.

Audio Level Adjustment in REV Mode

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For the U.S.A. and Canada

SAFETY CHECK-OUT

After correcting the original service problem, perform the following safety checks before releasing the set to the customer :

Check the metal trim, "metallized" knobs, screws, and all other exposed metal parts for AC leakage. Check leakage as described below.

LEAKAGE TEST

The AC leakage from any exposed metal part to earth ground and from all exposed metal parts to any exposed metal part having a return to chassis, must not exceed 0.5 mA. Leakage current can be measured by any one of three methods.

1. A commercial leakage tester, such as the Simpson 229 or RCA WT-540A. Follow the manufacturers' instructions to use these instruments.
2. A battery-operated AC milliammeter. The Data Precision 245 digital multimeter is suitable for this job.
3. Measuring the voltage drop across a resistor by means of a VOM or battery-operated AC voltmeter. The "limit" indication is 0.75 V, so analog meters must have an accurate low-voltage scale. The Simpson 250 and Sanwa SH-63Trd are examples of a passive VOM that is suitable. Nearly all battery operated digital multimeters that have a 2 V AC range are suitable. (See Fig. A)

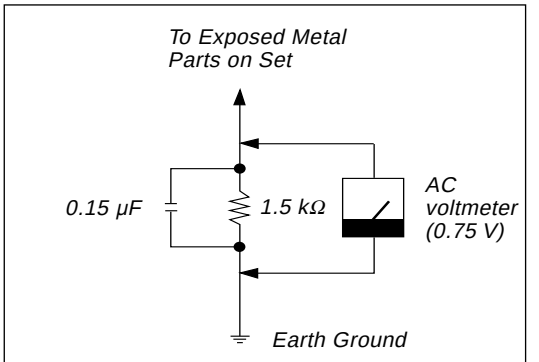

Fig A. Using an AC voltmeter to check AC leakage.

DNW-A100 (UC)
DNW-A100P (CE, UC)
DNW-A50 (UC)
DNW-A50P (CE, UC)
DNW-A45 (UC)
DNW-A45P (CE, UC) E
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